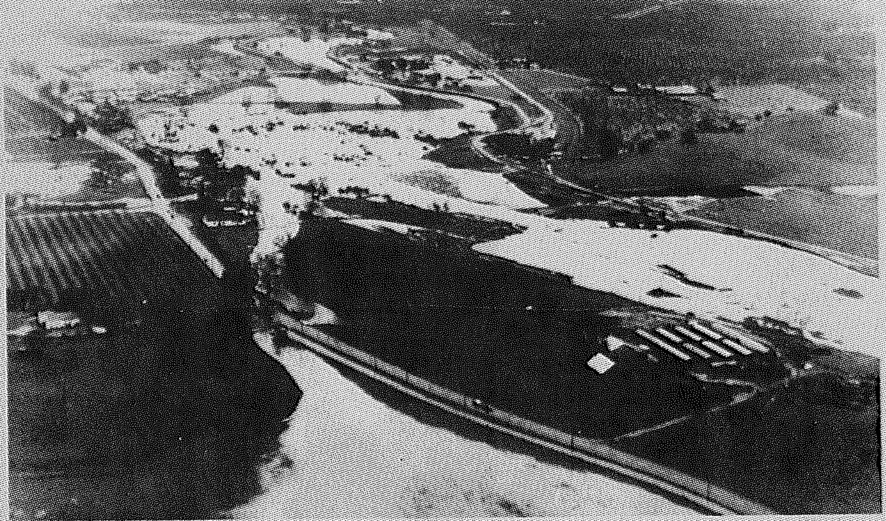
FLOOD PLAIN INFORM ON

1

ALAMITOS CREEK

INCLUDING
GUADALUPE CREEK-ARROYO CALERO
AND SANTA TERESA CREEK
SANTA CLARA COUNTY, CALIFORNIA



PREPARED FOR SANTA CLARA COUNTY
FLOOD CONTROL AND WATER DISTRICT
BY THE DEPT. OF THE ARMY,
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS,
SAN FRANCISCO, CA.
JULY 1973

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PREFACE

The area covered by this report is subject to flooding from Alamitos-Calero Creeks. The properties on the flood plain along this stream are both agricultural and urban. However, urbanization in the basin is proceeding rapidly. The properties on the flood plain along Alamitos-Calero were inundated by the flood of 1958. The open spaces in the flood plain are already being subjected to pressure for development. Studies indicate that even larger floods, than those of the past, are possible.

This report has been prepared because a knowledge of flood potential and flood hazards is important in land use planning and for management decisions concerning flood plain utilization. It includes a history of flooding in the Alamitos-Calero Basin and identifies those areas that are subject to possible future floods. Special emphasis is given to these possible future floods through maps, photographs, profiles, and cross sections. The report does not provide solutions to flood problems; however, it does furnish a suitable basis for the adoption of land use controls to guide flood plain development and thereby prevent intensification of the loss problems. It will also aid in the identification of other flood damage reduction techniques such as works to modify flooding and adjustments including floodproofing which might be embodied in an overall flood plain management (FPM) program. Other FPM program studies, those of environmental attributes and the current and future land use role of the flood plain as part of its surroundings, would profit from this information.

At the request of the Santa Clara County Flood Control and Water District and endorsement of the California Department of Water Resources, this report was prepared by the San Francisco District Corps of Engineers under continuing authority provided in Section 206 of the 1960 Flood Control Act, as amended.

Assistance and cooperation of the California Division of Highways, the Santa Clara County Flood Control and Water District and private citizens in supplying useful data and photographs for the preparation of this report are appreciated.

Additional copies of this report can be obtained from the Santa Clara County Flood Control and Water District. The San Francisco District Corps of Engineers, upon request, will provide technical assistance to planning agencies in the interpretation and use of the data presented as well as planning guidance and further assistance, including the development of additional technical information.

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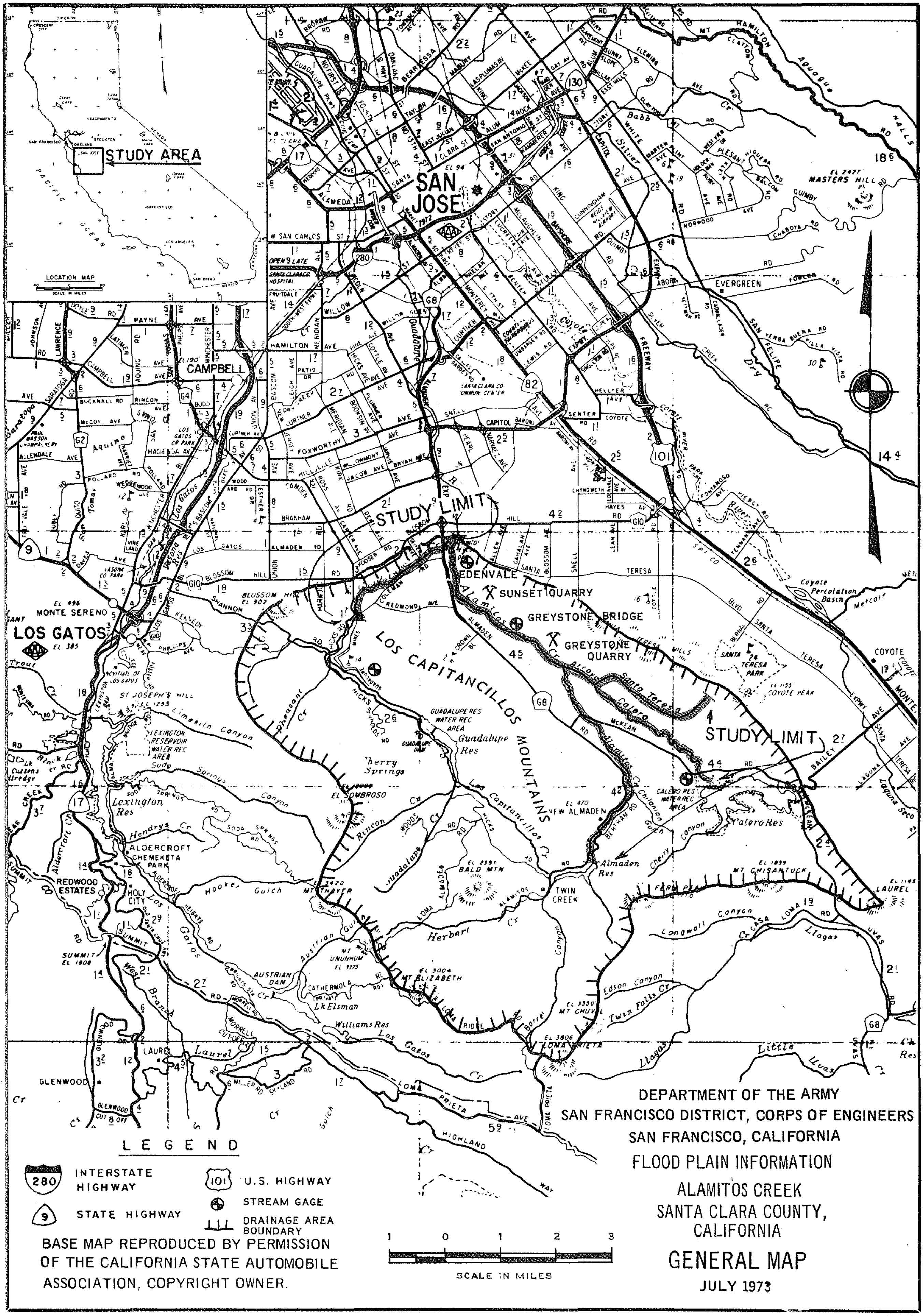

BASE MAP REPRODUCED BY PERMISSION OF THE CALIFORNIA STATE AUTOMOBILE ASSOCIATION, COPYRIGHT OWNER.

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

FLOOD PLAIN INFORMATION

ALAMITOS CREEK
SANTA CLARA COUNTY,
CALIFORNIA

GENERAL MAP

JULY 1973

PLATE 1

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BACKGROUND INFORMATION

Settlement

[1]Since ancient times the Indians of the Santa Clara Valley visited the hill of red earth (cinnabar) above the poplar-lined stream which the Spaniards later called the Arroyo de los Alamitos (the "Little River of the Poplar Trees"). The red earth made excellent pigment which the Indians used for adornment.

As early as 1824 the Spanish settlers of the valley knew about the red hill and its strange pigments. In that year an attempt was made by the Robles brothers, Secundino and Teodoro, and by Don Antonio Sunol, a member of the San Jose Council, to find silver or gold in the deposit; and in time the excavation was called "La Mina Santa Clara."

In the year 1842 Governor Alvarado made grants of land in this vicinity to two men; on August 1, he gave Rancho San Vicente to Jose de los Reyes Berressa (Berrellesa, Berreyesa), and on June 16, Rancho Canada de los Capitancillos to Justo Larios. Three years later actual interest arose in the mineral deposits contained in these lands.

Andres Castillero had made several trips between Mexico and Alta California in the decade previous to 1845, the year in which he was shown a sample of ore from La Mina Santa Clara. His presence in the north at this time as a deputy of the Mexican government was occasioned by a plan for moving troops from Mexico to aid in the control of foreigners, who were invading California in considerable numbers. By some chance, upon this visit, he was told of this earlier identified but not forgotten ore.

On November 22, 1845, Andres Castillero filed with Alcalde Pedro Chaboya (Chabolla) in San Jose a document in which he claimed discovery of "silver with a ley of gold" on the rancho of Jose Reyes Berryessa. In conformity with the mining ordinances, he asked that notices of his discovery and of his intention for its development be affixed in public places. After making certain crude tests he filed a second document in the following month reporting the discovery of "liquid quicksilver" in the deposit, and shortly thereafter went back to Mexico.

New Almaden, named for the great Almaden mine in Spain, became the most famous and one of the most productive qucksilver mines in the world, and at one time there was a thriving town centered about it. In 1863 the mine and all the improvements were sold to Quicksilver Mining Company of New York for $1,750,000.

The only part of the new Almaden complex ordinarily accessible to the public is the hacienda. The picturesque settlement has remained little changed over the years. Its main street follows the bank of the stream, where poplars still grow undisturbed. At the head of the long row of tiny, low-roofed frame, brick, and adobe houses with their tidy gardens, stands a great mansion, the "Casa Grande," home of the mine superintendent in times past. It is thought that it was erected on the site of the adobe built there by the Spanish in 1827.

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[1] Extracted from "Historic Spots in California" Third Edition by Hoover, Rensch and Rensch. Revised by Abeloe. Stanford University Press. Stanford, CA 1970, Pg. 435.

The little town awoke to new life in 1927, when it was restored as a weekend and summer resort. Happily, much of the picturesque aspect of the place has been preserved and the romance of old California still gathers about its quaint domiciles and its old adobe store.

For its importance to the nation and the world, New Almaden has been registered and marked as a National Historic Landmark by the Department of the Interior. An interesting museum is maintained in one of the old adobes at the hacienda.

The Stream and Its Valley

The Alamitos-Calero Creek system is located along the southwest border of the Santa Clara County. The basin drains an area of about 53 square miles.

Primarily the area is mountainous. Elevations within the basin range from about 190 feet mean sea level at the mouth of Alamitos Creek to more than 3,800 feet at the top of Loma Prieta Mountain. In the northwestern sector of the basin there is a long, narrow valley, about 10 square miles in area, which is already showing the effects of urbanization.

Three reservoirs, Calero, Almaden and Guadalupe were constructed in 1935 all are rolled earthfilled dams. Guadalupe Creek generally flows north turning eastward to join Alamitos Creek and form the Guadalupe River, the general slope of the study reach is 440 feet per mile. Alamitos Creek flows northwest with a slope of 94 feet per mile. Calero and Santa Teresa Creeks flow north-westward with slope of 42 and 140 feet per mile, respectively.

Alamitos, Calero, Guadalupe and Santa Teresa Creeks were studied in detail for the report and the flow contributions from all contributing streams were considered. Drainage areas contributing to runoff within the study reach are shown in Table 1.

TABLE 1

DRAINAGE AREAS

Location	Drainage area sq. mi.
Guadalupe Greek at Guadalupe Reservoir	5.9
Guadalupe Creek at Mouth	14.5
Alamitos Creek at Almaden Dam	12.0
Alamitos Creek at Mouth	26.3
Calero Creek at Calero Dam	6.9
Calero Creek at Mouth	12.5
Basin Total	53.3

The climate of the area is relatively mild. Temperatures range from the average high of 81 degrees in July to an average low of 49 degrees in January. Ninety percent of the rainfall occurs in the late fall and winter months with January usually having the largest amount of rainfall. Although thunderstorms do occur in the summer months, they do not contribute significantly to the annual precipitation.

Developments in the Flood Plain

The primary development within the basin is the residential buildup that occurs in the valley through which Alamitos Creek and Calero Creek run and the lower two miles of the Guadalupe Creek. There are resort developments in Almaden Canyon around the village of New Almaden and at Twin Creeks at the upper end of Almaden Reservoir. In Los Capitancillos mountains, a low ridge that divides the Alamitos Creek and Guadalupe Creek watershed, are the remains of the once flourishing quicksilver mines. Three water impoundment reservoirs lie within the basin, Almaden, Calero and Guadalupe. Storage releases are made within the system for municipal water, irrigation and percolation.

FLOOD SITUATION

Sources of Data and Records

The U.S.G.S. and Santa Clara County maintain stream gages on Almaden Creek, Calero Creek and Guadalupe Creek, U.S.G.S. gage Alamitos Creek near Edenvale, California, has been in operation since March 1930. U.S.G.S. gage Guadalupe Creek at Guadalupe has also been in operation since March 1930.

To supplement the records at the gaging stations, newspaper files, historical documents and records were searched for information concerning past floods. These records have aided in developing a knowledge of floods which have occurred in the Alamitos-Calero Creek Basin.

Maps prepared for this report were based on U.S. Geological Survey quadrangle sheets entitled "Mt. Madonna, Los Gatos, Santa Teresa Hills, Morgan Hill, Laurel, Loma Prieta," all were photo revised in 1968. Topographic maps provided by the Santa Clara County Flood Control and Water District were used in determining the flood plains. Structural data on bridges and culverts were obtained from the Santa Clara County Flood Control and Water District, Santa Clara County Highway Department and field surveys by the San Francisco District, U.S. Army Corps of Engineer personnel.

Crest stages and discharges for known floods at gaging stations on Alamitos and Guadalupe Creeks are shown in Tables 2 and 3.

TABLE 2

FLOOD CREST ELEVATIONS
ALAMITOS CREEK NEAR EDENVALE

Date of Crest	Estimated Peak Discharge c.f.s.	Stage a/
April 2, 1958	4,500	-
December 23, 1955	4,140	206.6
December 27, 1931	2,670	b/
April 4, 1941	2,520	b/

a/ Feet, mean sea level datum.
b/ Gages at different locations and datums.

TABLE 3

FLOOD CREST ELEVATIONS
GUADALUPE CREEK AT GUADALUPE

Date of Crest	Estimated Peak Discharge c.f.s.	Stage	Elevation a/
April 2, 1958	2,750	6.31	331.31
January 12, 1952	1,330	4.22	329.22
December 22, 1955	1,320	4.20	329.20
December 28, 1931	1,160	4.05	329.05

a/ Feet, mean sea level datum.

Only minor flooding occurs on the creeks of the Alamitos-Calero Basin system. On Alamitos most flooding is over the right bank near Sunset Quarry and in the Greystone area. Minor flooding occurs on Calero Creek in the upper reaches and on Guadalupe Creek in the vicinity of Camden Road bridge. Other flooding occurs in the flat right bank area of the Guadalupe along Coleman Road opposite its intersection with Redmond Avenue. Flooding and threats of flooding promote action by local officials in flood warning and flood-fighting activities.

Flood Season and Flood Characteristics

The flood season in the Alamitos-Calero Basin extends from October through April when flooding may be caused by intense rainstorms over the basin. Runoff quantities are affected by prior rainfall, soil condition and available storage capacities in the basin reservoirs. When all reservoirs are full, a storm of smaller intensity may cause a larger flood than would a greater storm when the reservoirs are empty or near empty. Floodflow stages can rise from near zero to extreme flood peaks in a relatively short period of time with high velocities in the main channel of the streams.

Factors Affecting Flooding and Its Impact

Obstructions to floodflows — Natural obstructions to floodflows include trees, brush and other vegetation growing along the streambanks in floodway areas. Manmade encroachments on or over the streams such as dams, bridges and culverts can also create more extensive flooding than would otherwise occur. Representative obstructions to floodflows are shown in Figures 1 through 6.

During floods, trees, brush and other vegetation growing in floodways impede floodflows, thus creating backwater and increased flood heights. Trees and other debris may be washed away and carried downstream to collect on bridges and other obstructions to flow. As floodflow increases, masses of debris break loose and a wall of water and debris surges downstream until another obstruction is encountered. Debris may collect against a bridge until the load exceeds its structural capacity and the bridge is destroyed. The limited capacity of obstructive bridges or culverts, debris plugs at the culvert mouth or a combination of these factors retard floodflows and result in flooding upstream, erosion around the culvert entrance and bridge approach embankments and possible damage to the overlying roadbed.

In general, obstructions restrict floodflows and result in overbank flows and unpredictable areas of flooding, destruction of or damage to bridges and culverts and an increased velocity of flow immediately downstream. It is impossible to predict the degree or location of the accumulation of debris; therefore, for the purposes of this report, it was necessary to assume that there would be no accumulation of debris to clog any of the bridge or culvert openings in the development of the flood profiles.

The dams on Alamitos, Calero and Guadalupe Creeks, as well as the percolation ponds associated with the creek system, provide some flood reduction as described in subsequent sections.

Alamitos, Calero, Guadalupe and other creeks in the basin are spanned 36 times by bridges and culverts. Pertinent information on some of the bridges can be found in Table 6. Many of these bridges are obstructive to floodflows.

Flood damage reduction measures — These measures are limited to construction and maintenance performed by local interests. Federal and State agencies have not participated in construction of formal damage prevention measures. Santa Clara County Flood Control and Water District has prepared plans for flood prevention works within the basin but no construction has been started.

Some flood protection is provided by Calero Reservoir (10,280 acre-feet), Almaden Reservoir (1,790 acre-feet), and Guadalupe Reservoir (3,460 acre-feet). The degree of protection afforded depends on the actual acre-feet available for flood storage. The reservoirs are primarily for water supply and flood control is only incidental to the water supply operation.

Other factors and their impacts

Flood warning and forecasting — No specific river or flood forecasts are issued for the Alamitos-Calero Creek area by the Federal-State River Forecast Center in Sacramento. However, forecasts of heavy rain are provided to Santa Clara County by the NOAA, National Weather Service Forecast Office in San Francisco. General weather forecasts of intense rainfall with accompanying flood warnings are issued and are available by telephone, newspapers, radio and television.

Flood-fighting and emergency evacuation plans — The Santa Clara County Flood Control and Water District has organized an Emergency Operations Center. The Center consists of the Chief of Emergency Operations aided by a Public Information Officer and an Emergency Coordinatior plus related support staffing. Four additional units, Data Collection, Flood Information, Water Operations, and Emergency Actions complete the organization.

The Emergency Operations Center is maintained in an "Alert" status from 1 October to 1 May each year. When the apparent situation requires 24-hour vigilance, the Center goes into a "Pre-Emergency" operation. As the gravity of the situation increases and flooding is occurring and threatens to increase, a full "Emergency" condition is entered into. Upon termination of emergency conditions, the Center reverts to the "Alert" status until the situation again changes or the flood season terminates.

Under the Center operation, the Data Collection and Flood Information Units primarily collect, organize, coordinate and publish information relating to the flood situation, flooding and flood damage. The Water Operation Unit operates the water system — reservoirs, pipelines, canals, etc., in order to minimize flooding and flood damage.

The Emergency Actions Unit with available crew does all emergency maintenance within its capabilities and supervises and coordinates the work of others.

Requests for Federal and/or State aid are initiated, coordinated and supervised through the Emergency Operations Center.

Material storage on the flood plain — There are no significant amounts of floatable material stored in the flood plains of the Alamitos-Calero Basin. During the time of floods normal amounts of floatable materials, generally found in residential as well as rural areas, would be washed downstream. A number of the private bridges spanning the creeks of the basin system appear susceptible to destruction and floatation by floodwaters. All these materials that may be carried downstream by floodwaters could damage downstream structures as well as piling up at bridges or culverts and increasing the flood problem.

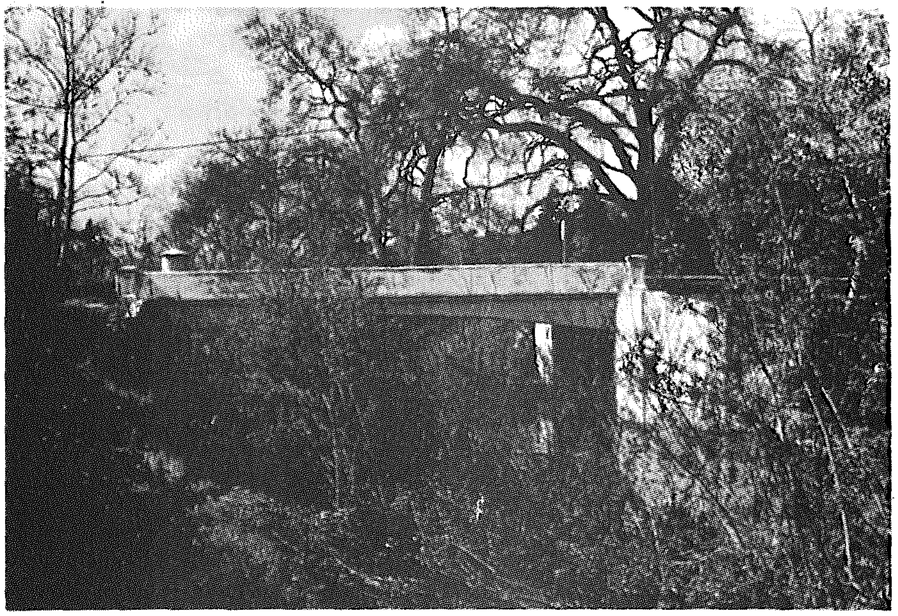


FIGURE 1 - Greystone Lane bridge over Alamitos Creek - Note overgrown banks

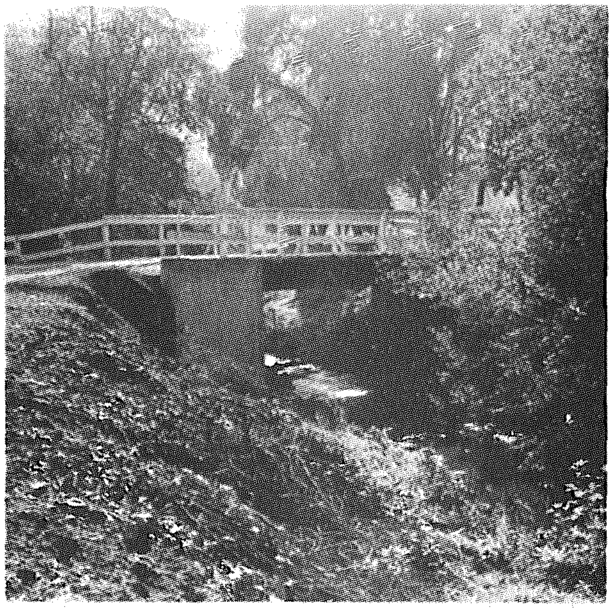


FIGURE 2 - Private bridge - note small opening

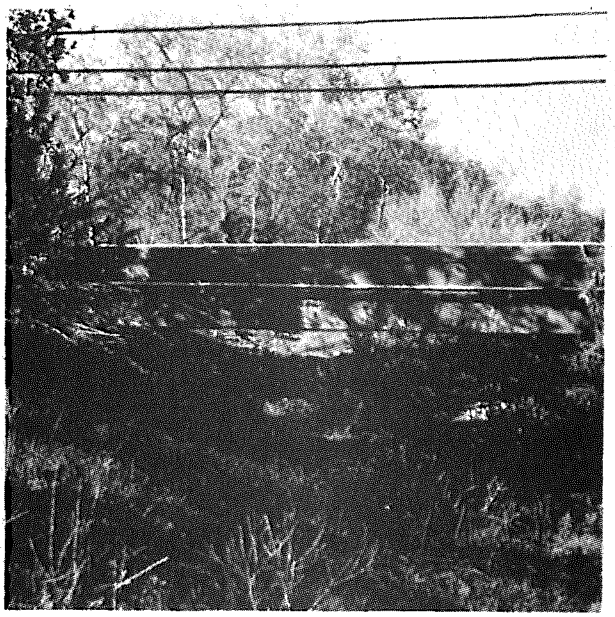


FIGURE 3 - McKean Road bridge over Alamitos Creek - Note low underclearance and growth

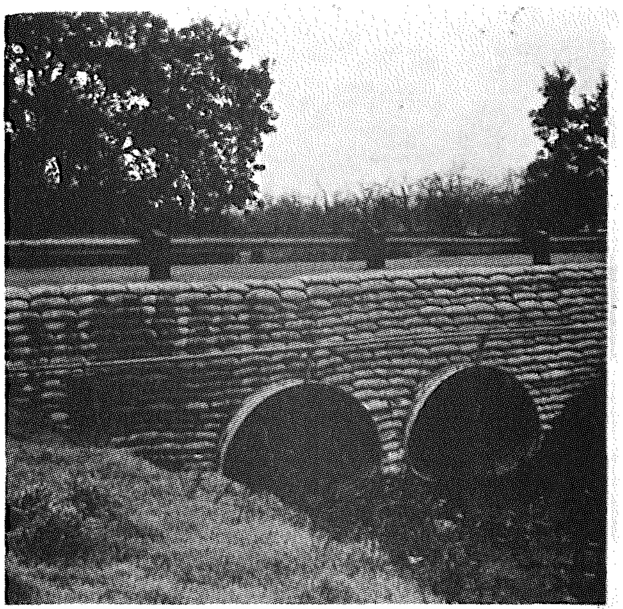


FIGURE 4 - Harry Road crossing Santa Teresa Creek - Note inadequate openings

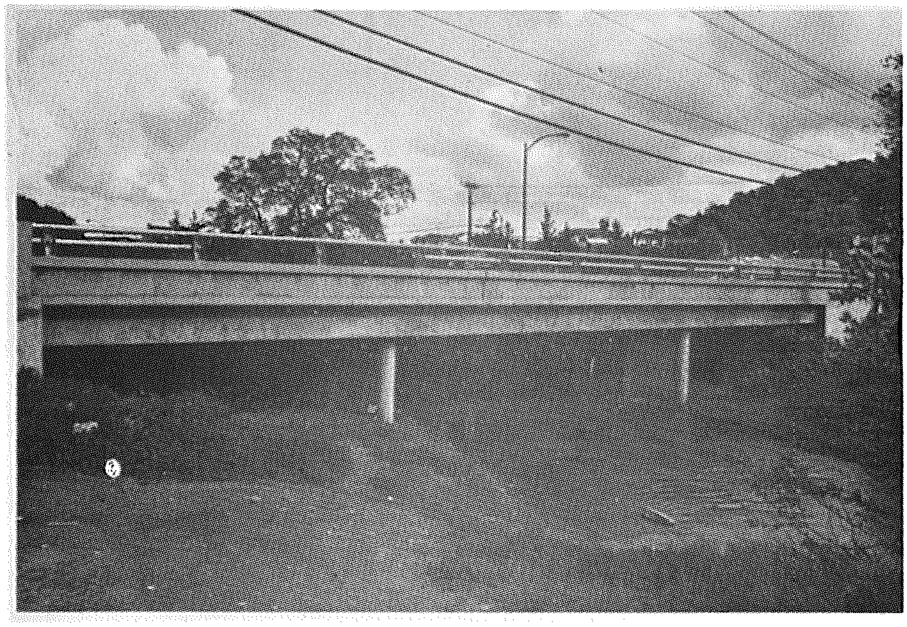


FIGURE 5 - Camden Road bridge over Guadalupe Creek

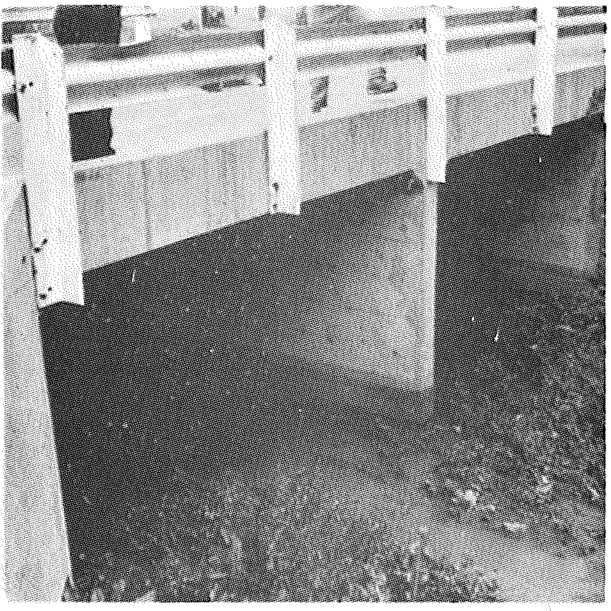


FIGURE 6 - Fortini Road bridge over Calero Creek

PAST FLOODS

Summary of Historical Floods

Damaging floods that have been reported in the basin as causing significant damage occurred in 1931, 1937, 1940, 1941, 1943, 1945, 1952, 1955, 1958, 1962, 1967, 1968.

Flood Records

Information on historical floods in the Alamitos-Calero Creek Basin was obtained from stream-gaging station records maintained by the U.S. Geological Survey at a number of locations within the basin. Stream gage records in the basin began in 1930. High watermarks were obtained, residents along the stream were interviewed and newspaper files and historical documents were searched for information concerning past floods.

Flood Descriptions

During the storm of December 1955, the gages at Guadalupe Reservoir and Almaden Reservoir recorded the following rainfall: 18-20 December - 8.65 and 8.92 inches, respectively, and 22-24 December - 8.63 and 11.99 inches, respectively. The December 1955 flood would have surpassed all previous records and caused greater damage except for the fact that the conservation reservoirs were not full and were able to store a great deal of the runoff. Continuous and heavy rainfall occurring over a period of several days prior to the flood, loosened and scoured out large trees and coupled with accumulations of debris which floated downstream became lodged at bridges and culverts obstructing the channel and causing severe local flooding. Erosion and undercutting of the banks and adjacent lands also contributed to flood hazard and damage by aggradation of the channel. In the Alamitos Creek area agricultural damages on 770 acres inundated amounted to $108,500 and consisted primarily of topsoil erosion and deposition of silt and debris in orchards. Damages to homes and grounds in the town of New Almaden amounted to $31,100. Heavy erosion of lands along the creek were suffered by property owners. Trees, stone and concrete retaining walls, barbecue pits, fences and garden furniture were washed away and lost. The most severe damage to urban commercial property was incurred by the New Almaden Museum, which had losses of $8,600. Two taverns and a dinner club had extensive damage to their grounds and gardens. Total urban commercial damages was an estimated $11,500. Rural commercial damage was severe. At a summer resort downstream from the town of New Almaden, over 100 picnic tables, 30 barbecue pits, and other articles were destroyed. Extensive cleaning and rehabilitation was necessary for the large modern swimming pool and filter house located on the property. Upstream, above the Almaden Reservoir, in the small settlement of Twin Creeks, three privately-owned bridges were washed out. Two houses at a summer resort were damaged severely and extensive damage occurred to the grounds and furnishings. Total rural commercial damages were an estimated $40,100. Repair and rehabilitation of Alamitos Creek bridge and repair and replacement of county roads washed out in the area were an estimated total of $11,600. Total damages incurred in the 1955 flood were estimated at $202,800.

During the floods of February-April 1958, Alamitos Creek remained within banks throughout the area below New Almaden. At New Almaden minor flooding occurred on picnic grounds and recreation facilities near the bank. There were some cases of heavy streambed erosion below New Almaden due to high velocities. There was no significant overbank flooding.

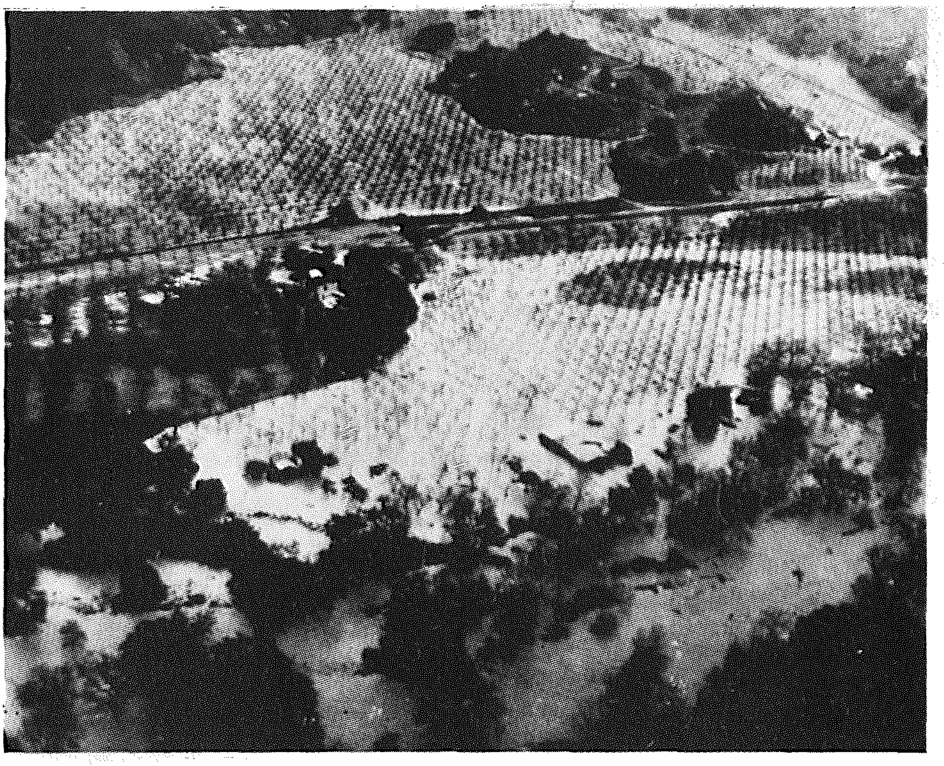


FIGURE 7 - 1955 Flood at Greystone Creek - Looking East

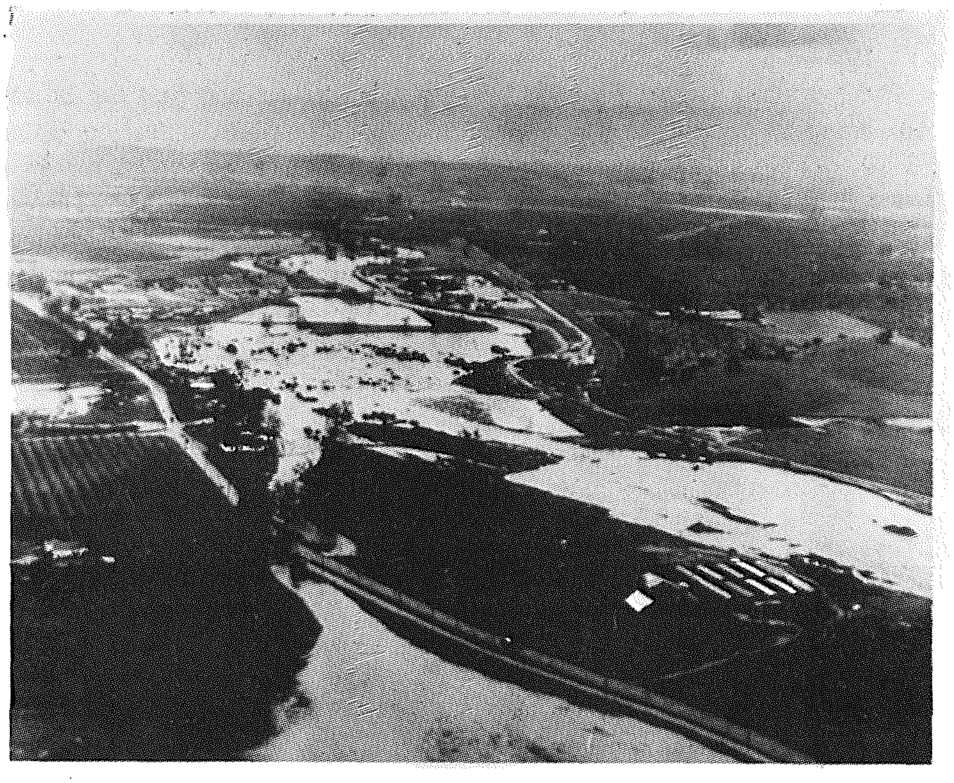


FIGURE 8 - 1955 Flood at Alamitos and Golf Creeks - Looking North

FUTURE FLOODS

Floods of the same or larger magnitude as those that have occurred in the past could occur in the future. Larger floods have been experienced in the past on streams with similar geographical and physiographical characteristics as those found in the study area. Similar combinations of rainfall and runoff which caused these floods could occur in the Alamitos-Calero Basin area. Therefore, to determine the flooding potential of the study area, it was necessary to consider storms and floods that have occurred in regions of like topography, watershed cover and physical characteristics. Discussion of the future floods in this report is limited to those that have been designated as the Intermediate Regional Flood and the Standard Project Flood. The Standard Project Flood represents a reasonable upper limit of expected flooding in the study area. The Intermediate Regional Flood may reasonably be expected to occur more frequently although it will not be as severe as the infrequent Standard Project Flood.

Intermediate Regional Flood

The Intermediate Regional Flood is defined as one that could occur once in 100 years on the average, although it could occur in any year. The peak flow of this flood was developed from statistical analyses of streamflow and precipitation records and runoff characteristics for the stream under study. In determining the Intermediate Regional Flood for the Alamitos-Calero Basin, statistical studies were made using the record of flood data from the U.S. Geological Survey gaging stations located in the basin. Peak flows thus developed for the Intermediate Regional Flood at selected locations in the study area are shown in Table 4.

Standard Project Flood

The Standard Project Flood is defined as a major flood that can be expected to occur from a severe combination of meteorological and hydrological conditions that is considered reasonably characteristic of the geographical area in which the study area is located, excluding extremely rare combinations. The Corps of Engineers, in cooperation with the NOAA Weather Service, has made comprehensive studies and investigations based on the past records of experienced storms and floods and has developed generalized procedures for estimating the flood potential of streams. Peak discharges for the Standard Project Flood at selected locations in the study area are shown in Table 4. The relative water surface elevations for the Intermediate Regional Flood and the Standard Project Flood are shown on Plates 8-12.

TABLE 4

PEAK FLOWS FOR INTERMEDIATE REGIONAL AND STANDARD PROJECT FLOODS

Location	River Mile	Drainage Area sq. mi.	Intermediate Regional Flood Discharge cfs	Standard Project Flood Discharge cfs
Alamitos Creek				
1. At Almaden Reservoir	8.1	11.8	3,500	5,000
2. Upstream of Junction with Calero Creek	3.9	15.2	4,200	6,000
3. Downstream of Junction With Calero Creek	3.8	27.7	5,300	8,100
4. Upstream of Junction With Guadalupe Creek	0.1	38.8	6,400	9,400
Santa Teresa Creek	0.0	1.9	500	800
Calero Creek				
1. At Calero Reservoir	3.8	6.9	1,020	1,600
2. Upstream of Junction With Alamitos Creek	0.0	12.5	1,400	2,200
Guadalupe Creek				
1. At Guadalupe Reservoir	5.0	5.9	1,200	1,800
2. Upstream Of Junction With Alamitos Creek	0.0	14.5	3,000	4,800

Recorded peak discharge for the 2 April 1958 flood at Greystone Bridge was 4,300 c.f.s. This discharge does not reflect reductions attributable to the upstream reservoirs on the system; these reductions were due to the low water level in the reservoirs. This condition could not be expected to apply at all times. Table 5 shows a flood elevation comparison between the April 1958, the Intermediate Regional, and the Standard Project Flood at Greystone Bridge.

TABLE 5

FLOOD ELEVATIONS
(ALAMITOS CREEK AT GREYSTONE BRIDGE)

Flood	Elevation [a]
Standard Project	251.6
Intermediate Regional	250.4
2 April 1958	246.9

a/ Feet, mean sea level datum.

Frequency

A frequency curve of peak flows was constructed on the basis of available information and computed flows of floods up to the magnitude of the Standard Project Flood. The frequency curve thus derived, which is available on request, reflects the judgement of engineers who have studied the area and are familiar with the region; however, it must be regarded as approximate and should be used with caution in connection with any planning of flood plain use. Floods larger than the Standard Project Flood are possible but the combination of factors necessary to produce such large flows would be extremely rare.

Hazards of Large Floods

The extent of damage caused by any large flood depends on the depth and duration of flooding, velocity of flow, and rates of rise. An Intermediate Regional or Standard Project Flood in the Alamitos-Calero Basin would result in inundation of residential and commercial establishments in New Almaden and downstream in San Jose.

The hazards from great floods cannot be entirely expressed as tangibles. Although relationships, such as depth and velocity of flow, rate of rise and duration of flooding are a measure of the hazard, other less tangible factors must be considered. The amount and extent of damage caused by any flood depends also on the topography of the area flooded and developments in the flood plain. Deep floodwater flowing at high velocity and carrying floating debris would create conditions hazardous to persons or vehicles attempting to cross flooded areas. Hazardous flood conditions are relative to the size of the persons or objects experiencing the hazard. When potential loss of life is a factor, velocity of flow greater than two and a half feet per second, combined with depths of flow of one foot or more, must be considered hazardous; and if small children are involved, these figures may be excessive. Structural hazard generally begins when floodwaters first enter the structure or when the situation changes from nuisance to serious. Rapidly rising and swiftly flowing floodwater may trap persons in homes that are ultimately destroyed or in vehicles that are ultimately submerged. Waterlines can be ruptured by deposits of debris and the force of floodwaters, creating the possibility of contaminated domestic water supplies. Ruptured oil pipelines could result in contamination of flood plain areas by deposition of petroleum products. Decaying flood-deposited garbage or other organic materials could create health hazards. Isolation of areas by floodwater could create hazards in terms of medical, fire, or law enforcement emergencies.

Flooded areas and flood damages – The areas in the Alamitos-Calero Creek Basin that would be flooded by the Standard Project Flood are shown on Plate 2, which is also an index map to Plates 3 through 7. The actual limits of these overflow areas may vary somewhat from those shown on the maps because the contour interval and scale of the maps do not permit precise plotting of the flooded area boundaries. The areas that would be flooded by the Intermediate Regional and Standard Project Floods include commercial and residential sections and the associated streets, roads and private and/or public utilities in the areas. Considerable damages to these facilities would occur during an Intermediate Regional Flood. However, due to the wide extent, greater depths of flooding, higher velocity flow and longer duration of flooding during a Standard Project Flood, damage would be even more severe than during an Intermediate Regional Flood. Plates 8 through 12 show water surface profiles of the Intermediate Regional and Standard Project Floods. Depth of flow in the channel can be estimated from these illustrations. Typical cross sections of the flood plain at selected locations, together with the water surface elevation and lateral extent of the Intermediate Regional and Standard Project Floods are shown on Plates 13 and 14.

Obstructions – During floods, debris collecting on bridges and culverts could decrease their carrying capacity and cause greater water depths (backwater effect) upstream of these structures. Since the occurrence and amount of debris are indeterminate factors, only the physical characteristics of the structures were considered in preparing profiles of the Intermediate Regional and Standard Project Floods. Similarly, the maps of flooded areas show the backwater effect of obstructive bridges and culverts, but do not reflect increased water surface elevation that could be caused by debris collecting against the structures, or by deposition of silt in the stream channel under the structures. As previously indicated, there are three dams within the study area which have no flood control capacities nor will they seriously alter flow characteristics of floodwaters. Of the 36 bridges and culverts crossing the streams in the study area, most of them would be obstructive to the Intermediate Regional Flood and even more are obstructive to the Standard Project Flood. In some cases, bridges may be high enough so as not to be inundated by floodflows; however, the approaches to these bridges may be at lower elevations and subject to flooding and rendered impassable. Table 6 lists water surface elevations at selected bridges and culverts that may be restrictive during floodflows.

TABLE 6

ELEVATION DATA
BRIDGES ACROSS ALAMITOS, CALERO AND GUADALUPE CREEKS [a]

Identification	Mileage Above Mouth	Under Clearance [b]	Water Surface Elevation Intermediate Regional Flood [b]	Water Surface Elevation Standard Project Flood [b]
Alamitos Creek				
1. Greystone Bridge	2.3	248.5	250.4	251.6
2. McKean Road	4.4	327.5	325.0	326.0
3. Private Bridge	6.1	413.5	416.0	418.0
4. Bertram Road	6.3	425.0	425.0	426.6
5. Almaden Way	7.0	470.5	466.2	470.0
6. Almaden Road	7.1	472.0	470.5	474.5
Calero Creek				
1. Harry Road	0.9	318.5	324.4	327.4
2. Fortini Road	2.5	357.0	360.0	360.5
Gudalupe Creek				
1. Almaden Expressway	0.2	198.0	192.8	196.5
2. Camden Avenue	2.7	281.5	278.0	280.5

[a] There are a number of temporary bridges throughout the basin, that are not included in this table.

[b] Feet mean sea level datum.

Velocities of flow — Water velocities during floods depend largely on the size and shape of the cross sections, conditions of the stream, and the bed slope, all of which vary on different streams and at different locations on the same stream. During an Intermediate Regional Flood, velocities of main channel flow in the upper reaches of the streams in the study area would be 4 to 17 feet per second. Water flowing at this rate is capable of causing severe erosion to streambanks and fill around bridge abutments and transporting large objects. In the lower reaches, the velocities would be somewhat lower, averaging 4 to 14 feet per second. It is expected that velocity of flow during a Standard Project Flood would be slightly higher than during an Intermediate Regional Flood. Overbank flow for all the streams would average 1 to 4 feet per second. Water flowing at 2 feet per second or less would deposit debris and silt.

Rates of rise and duration of flooding — Intense rainfalls that accompany severe storm fronts usually produce the floods occurring in the Alamitos-Calero Creek Basin. There is a time lag of at least several hours to half a day before overbank flooding occurs in the downstream areas. Floods generally rise rapidly and stay out of banks for short periods of time. For the Intermediate Regional and Standard Project Floods at the Greystone Lane Bridge, Table 7 gives the maximum rate of rise, height of rise (from critical stage level to floodflow level), time of rise (time period corresponding to height of rise), and duration of critical stage (period of time flooding is above critical stage level).

TABLE 7

RATES OF RISE AND DURATION ALAMITOS CREEK

Flood	Maximum Rate of Rise ft/hr.	Height of Rise ft	Time of Rise hrs	Duration of Critical Stage hrs
Intermediate Regional Flood	3.2	8.1	9.0	7.8
Standard Project Flood	2.4	8.7	7.0	20.0

Photographs, future flood heights – The levels that the Intermediate Regional and Standard Project Floods are expected to reach at various locations in the Alamitos-Calero Creek Basin are indicated on the following photographs.

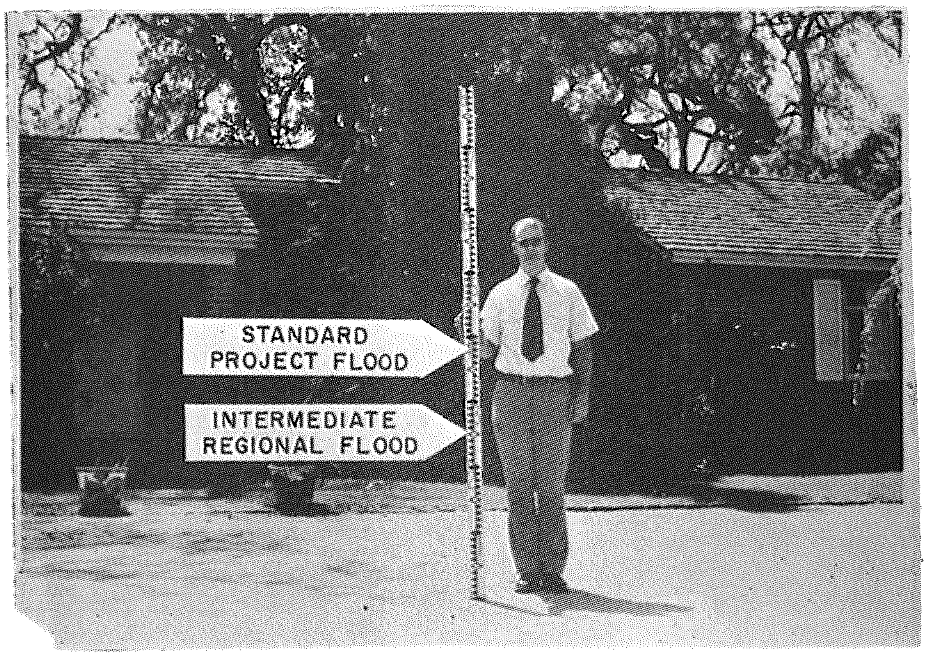


FIGURE 9 - Flood potential on Greystone Lane - 100 - feet upstream of Greystone bridge on the left bank of Alamitos Creek

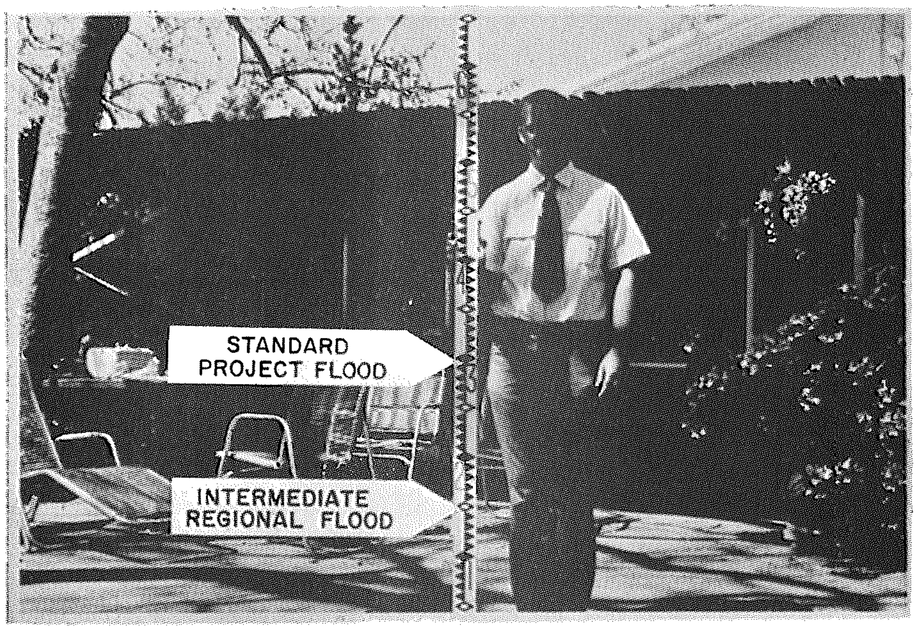


FIGURE 10 - Flood Potential on right bank of Calero Creek at Fortini Road

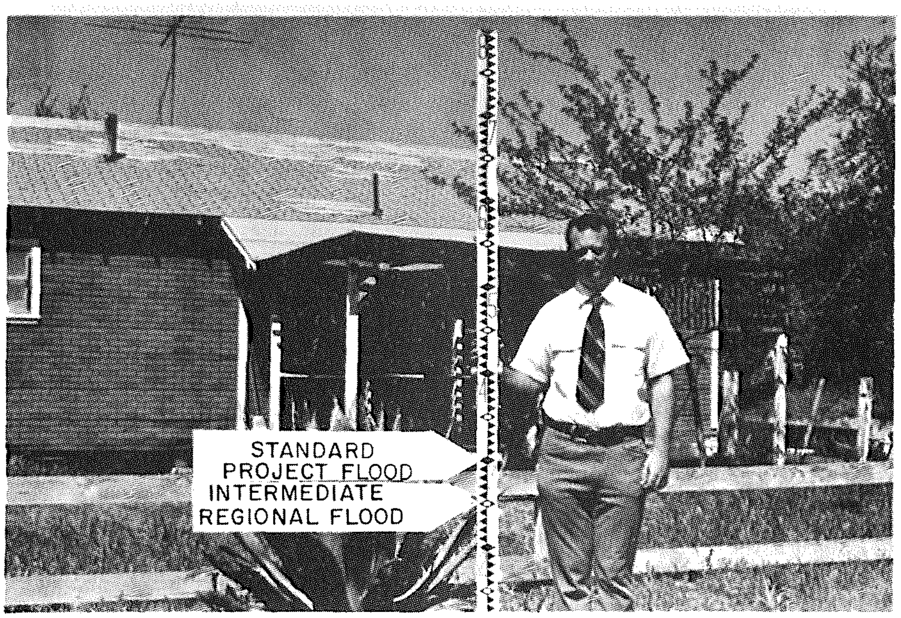


FIGURE 11 - Flood potential on left bank of Santa Teresa Creek at Fortini Road

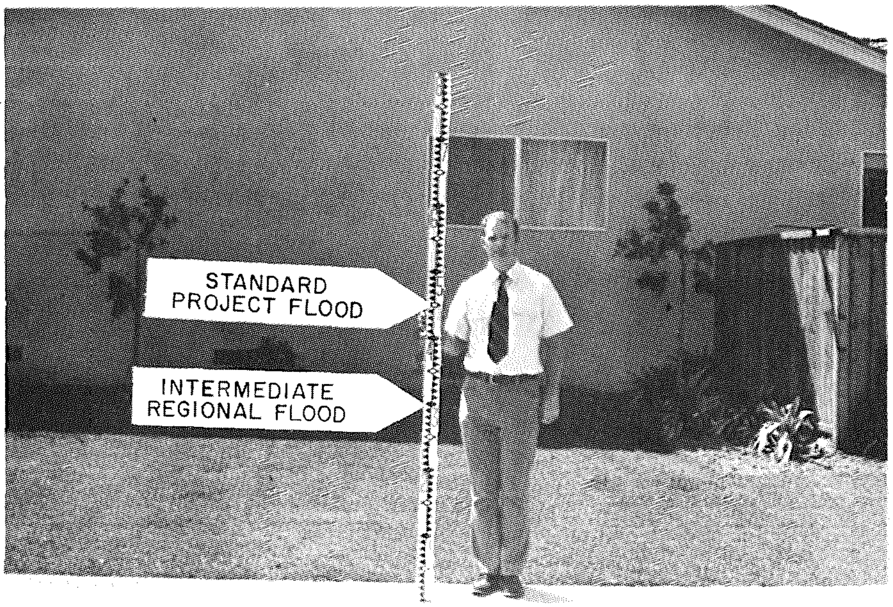


FIGURE 12 - Flood potential on Alamitos Creek at the corner of Winterset Way and Camden Avenue

GLOSSARY

Flood. The general and temporary condition of partial and complete inundation of normally dry land areas from the overflow of stream, river, or other inland waterways. Flooding may also result from tidal surges, abnormally high tidal water, tsunamis or rising coastal waters that result from hurricanes or other severe storms.

Flood Crest. The maximum stage or elevation reached by the waters of a flood at a given location.

Flood Peak. The maximum instantaneous discharge rate of a flood at a given location. It usually occurs at or near the time of maximum stage or crest.

Flood Plain. The relatively flat area or low land adjoining the channel of a river, stream, watercourse, ocean, lake or other body of standing water, which has been or may be covered by floodwater.

Flood Profile. A graph showing the relationship of water surface elevation to location, the latter generally expressed as the distance upstream from the mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditions at a given time or stage.

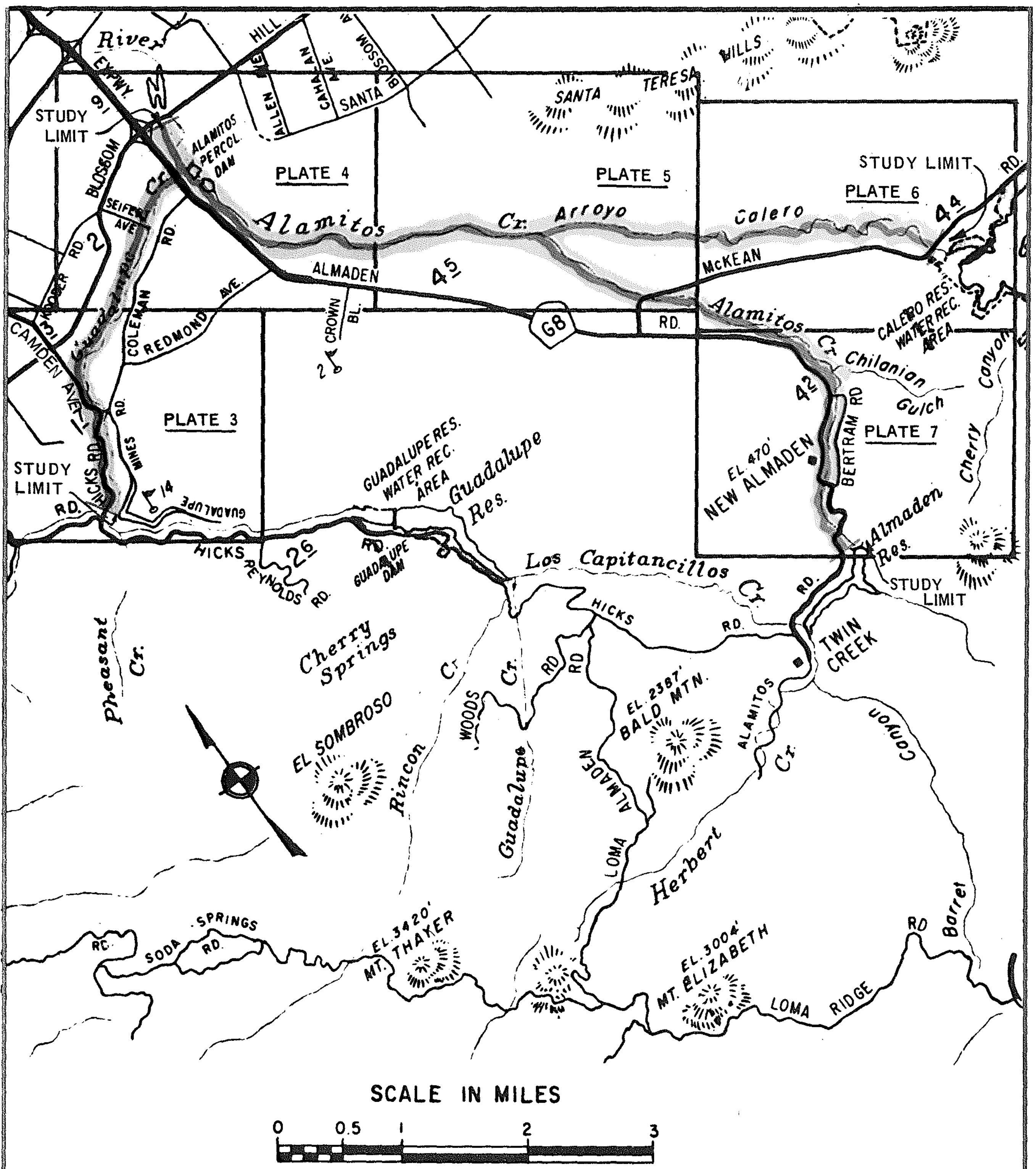
Flood Stage. The stage of elevation at which overflow of the natural banks of a stream or body of water begins in the reach or area under consideration.

Intermediate Regional Flood. A flood having an average frequency of occurrence in the order of once in 100 years although the flood may occur in any year. It is based on statistical analyses of streamflow records available for the watershed and analyses of rainfall and runoff characteristics in the "general region of the watershed."

Standard Project Flood. The flood that may be expected from the most severe combination of meteorological and hydrological conditions that are considered reasonably characteristic of the geographical region in which the drainage basin is located, excluding extremely rare combinations. Such floods, as used by the Corps of Engineers, are intended as practicable expressions of the degree of protection that should be sought in the design of flood control works, the failure of which might be disastrous.

Right or Left Bank. The bank on the right or left side of a river, stream, or watercourse looking downstream.

Underclearance Elevation. The elevation at the top of the opening of a culvert, or other structure through which water may flow along a watercourse.



BASE MAP REPRODUCED BY PERMISSION OF
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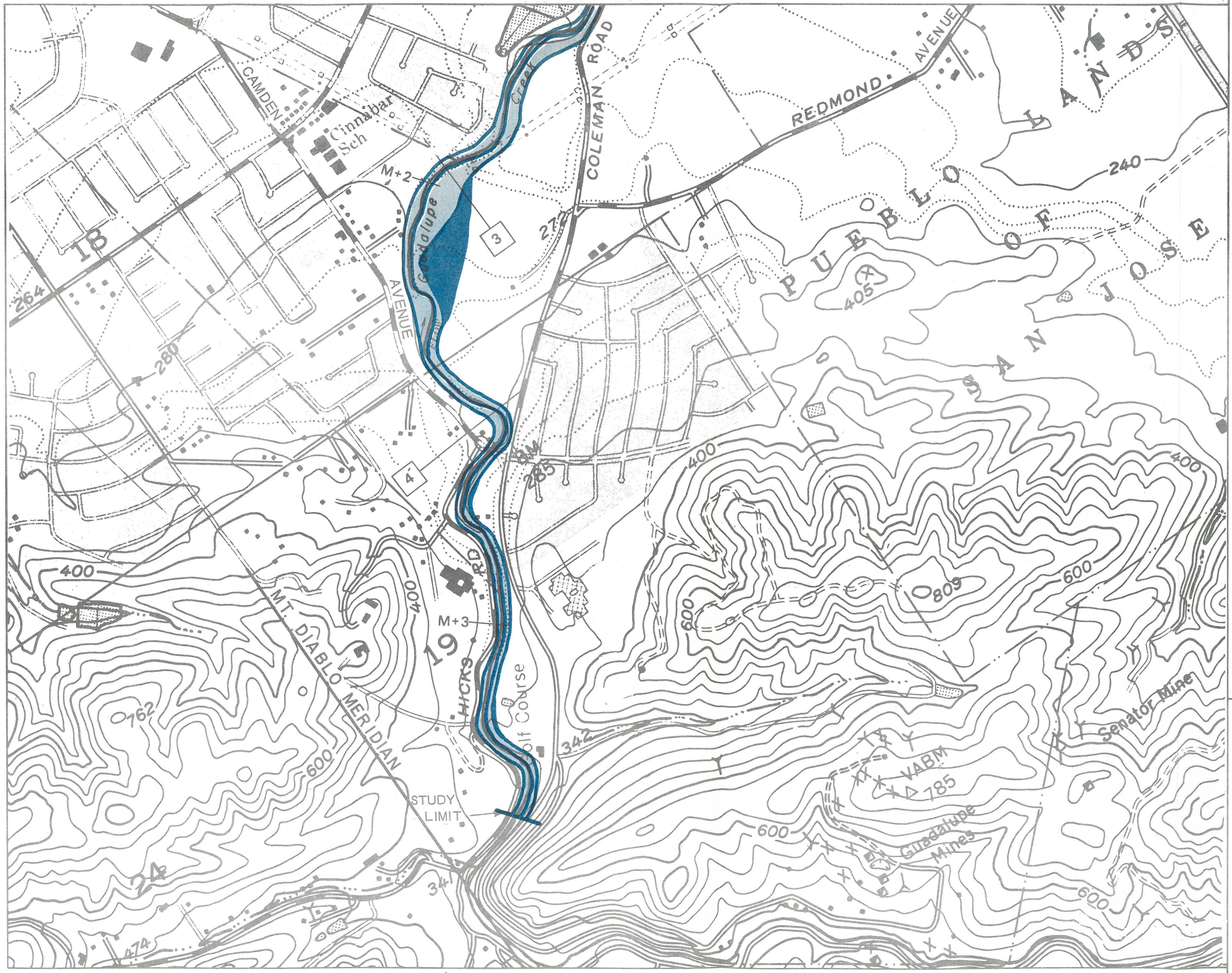
SAN FRANCISCO, CALIFORNIA
FLOOD PLAIN INFORMATION
ALAMITOS CREEK
SANTA CLARA COUNTY, CALIFORNIA

INDEX MAP – FLOODED AREA

JULY 1973

MATCH LINE PLATE 4



LEGEND

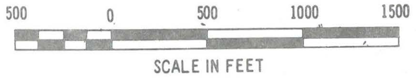
OVERFLOW LIMITS

▇	INTERMEDIATE REGIONAL FLOOD	STANDARD PROJECT FLOOD
M+4	MILES ABOVE MOUTH	
22	CROSS SECTION	
—260—	GROUND ELEVATION IN FEET SEA LEVEL DATUM	
▬	CHANNEL	

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOODPLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF

MINIMUM CONTOUR INTERVAL IS 10 FT



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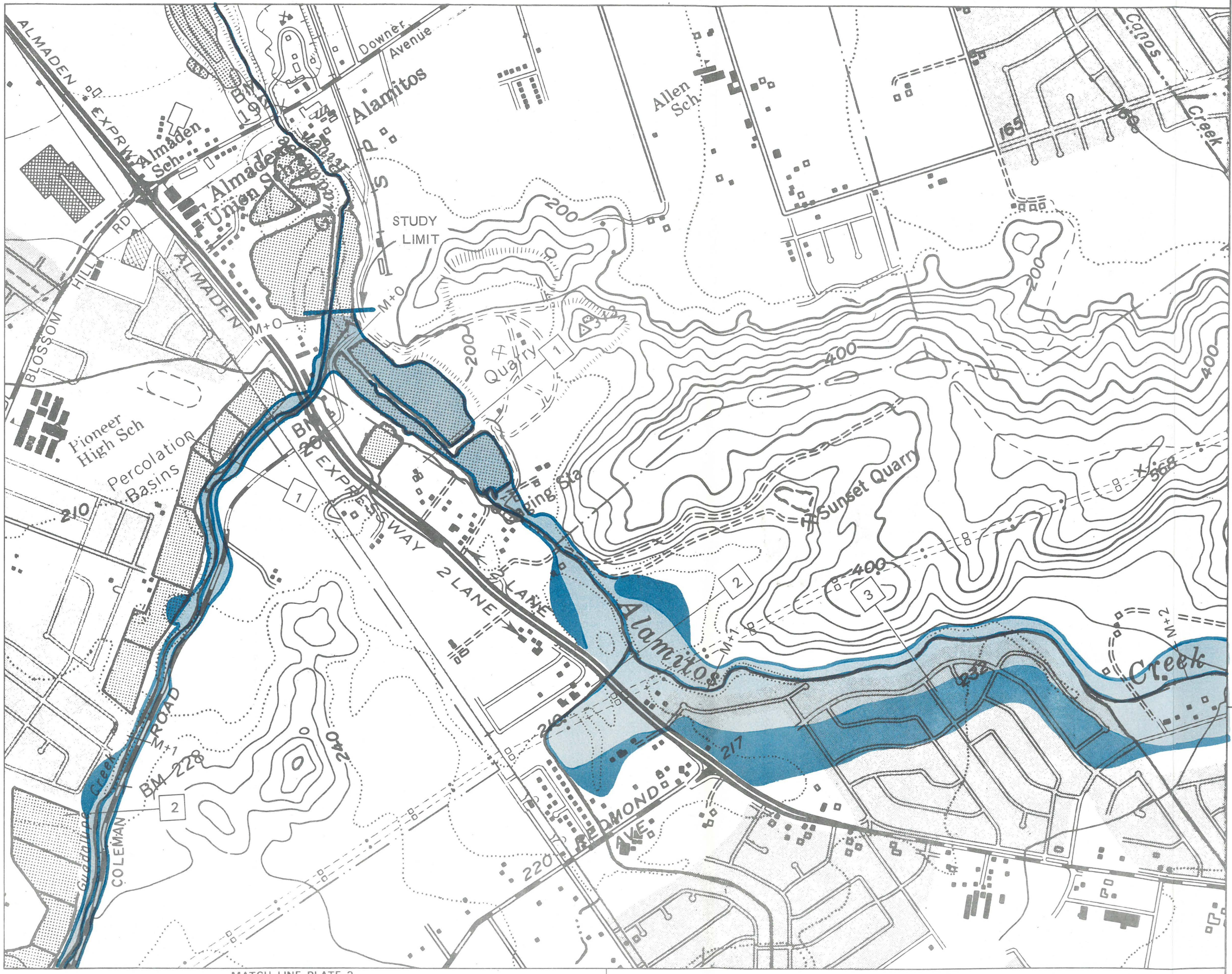
ALAMITOS CREEK
SANTA CLARA COUNTY, CALIFORNIA

FLOODED AREAS

JULY 1973



LEGEND

OVERFLOW LIMITS

▆	INTERMEDIATE REGIONAL FLOOD	STANDARD PROJECT FLOOD
M+4	MILES ABOVE MOUTH	
22	CROSS SECTION	
— 260 —	GROUND ELEVATION IN FEET SEA LEVEL DATUM	
▬	CHANNEL	

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOODPLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

MINIMUM CONTOUR INTERVAL IS 10 FT.

500 0 500 1000 1500

SCALE IN FEET

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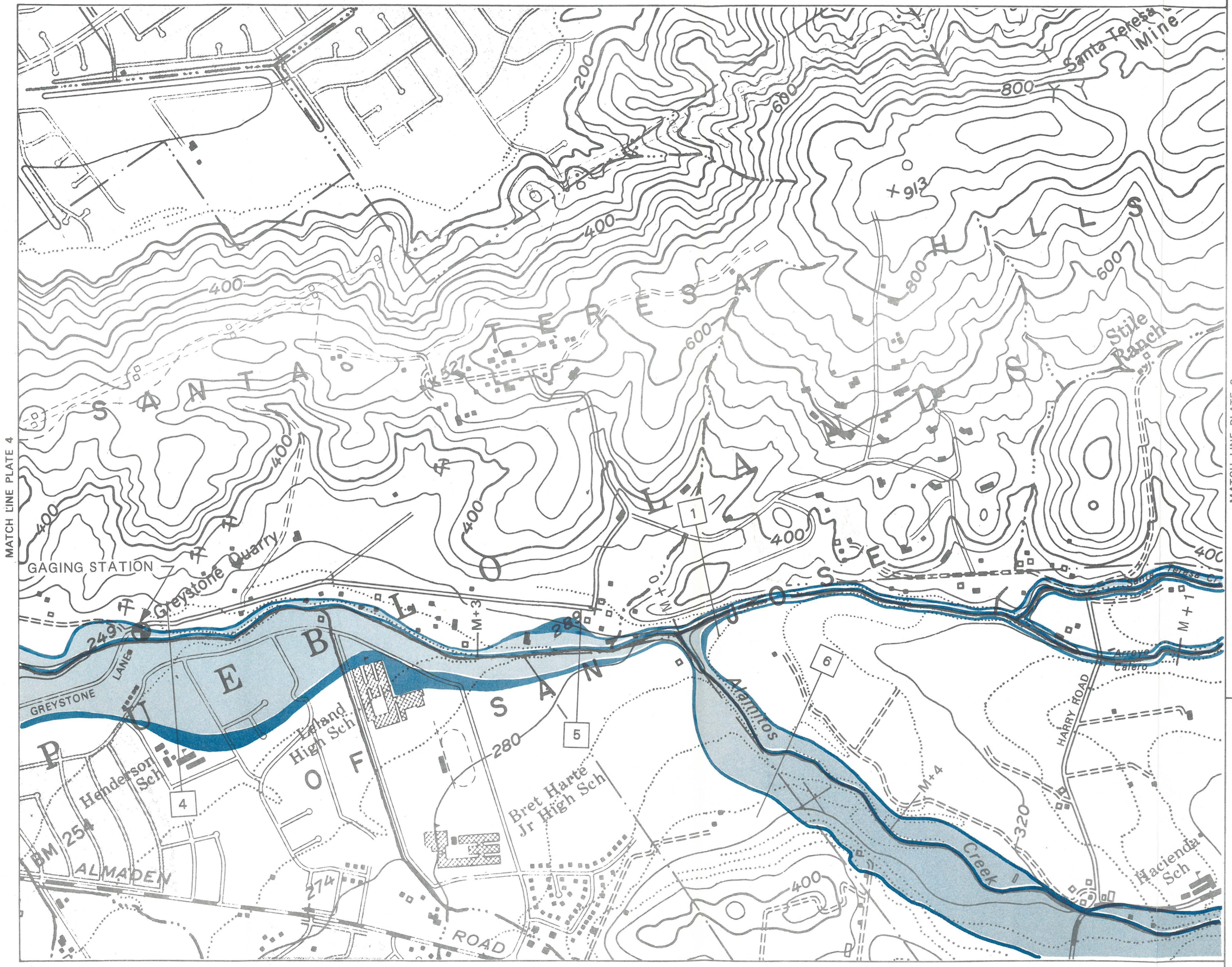
FLOOD PLAIN INFORMATION
ALAMITOS CREEK
SANTA CLARA COUNTY, CALIFORNIA

FLOODED AREAS

JULY 1973

PLATE 4



LEGEND

OVERFLOW LIMITS

▇	INTERMEDIATE REGIONAL FLOOD	STANDARD PROJECT FLOOD
M+4	MILES ABOVE MOUTH	
22	CROSS SECTION	
—260—	GROUND ELEVATION IN FEET SEA LEVEL DATUM	
▬	CHANNEL	

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOODPLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

MINIMUM CONTOUR INTERVAL IS 10 FT.

500 0 500 1000 1500
SCALE IN FEET

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
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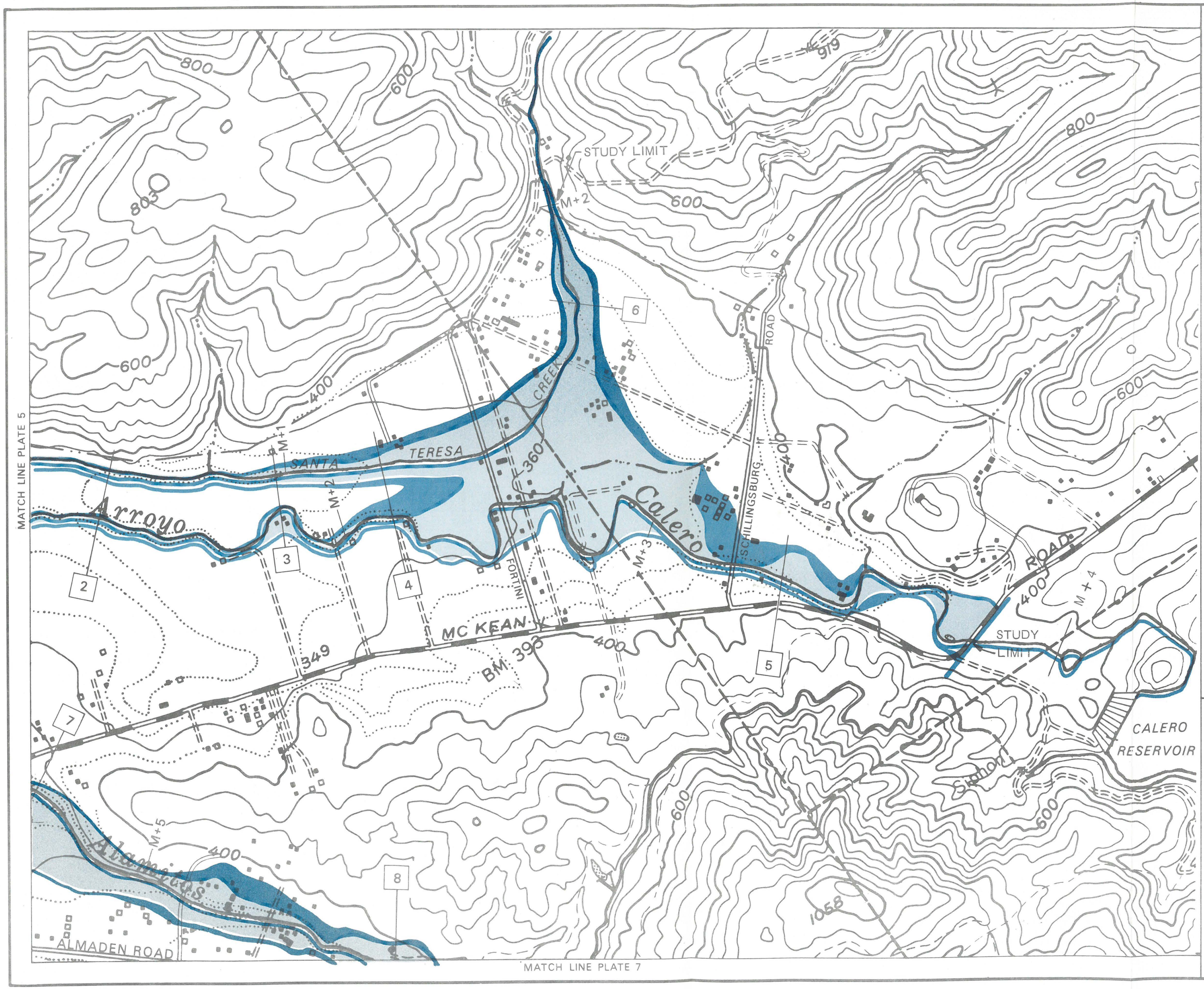
FLOOD PLAIN INFORMATION
ALAMITOS CREEK
SANTA CLARA COUNTY, CALIFORNIA
FLOODED AREAS

JULY 1973



LEGEND

OVERFLOW LIMITS

INTERMEDIATE REGIONAL FLOOD } STANDARD PROJECT FLOOD

M+4 — MILES ABOVE MOUTH

22 — CROSS SECTION

260 — GROUND ELEVATION IN FEET SEA LEVEL DATUM

CHANNEL

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOODPLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF

MINIMUM CONTOUR INTERVAL IS 10 FT.

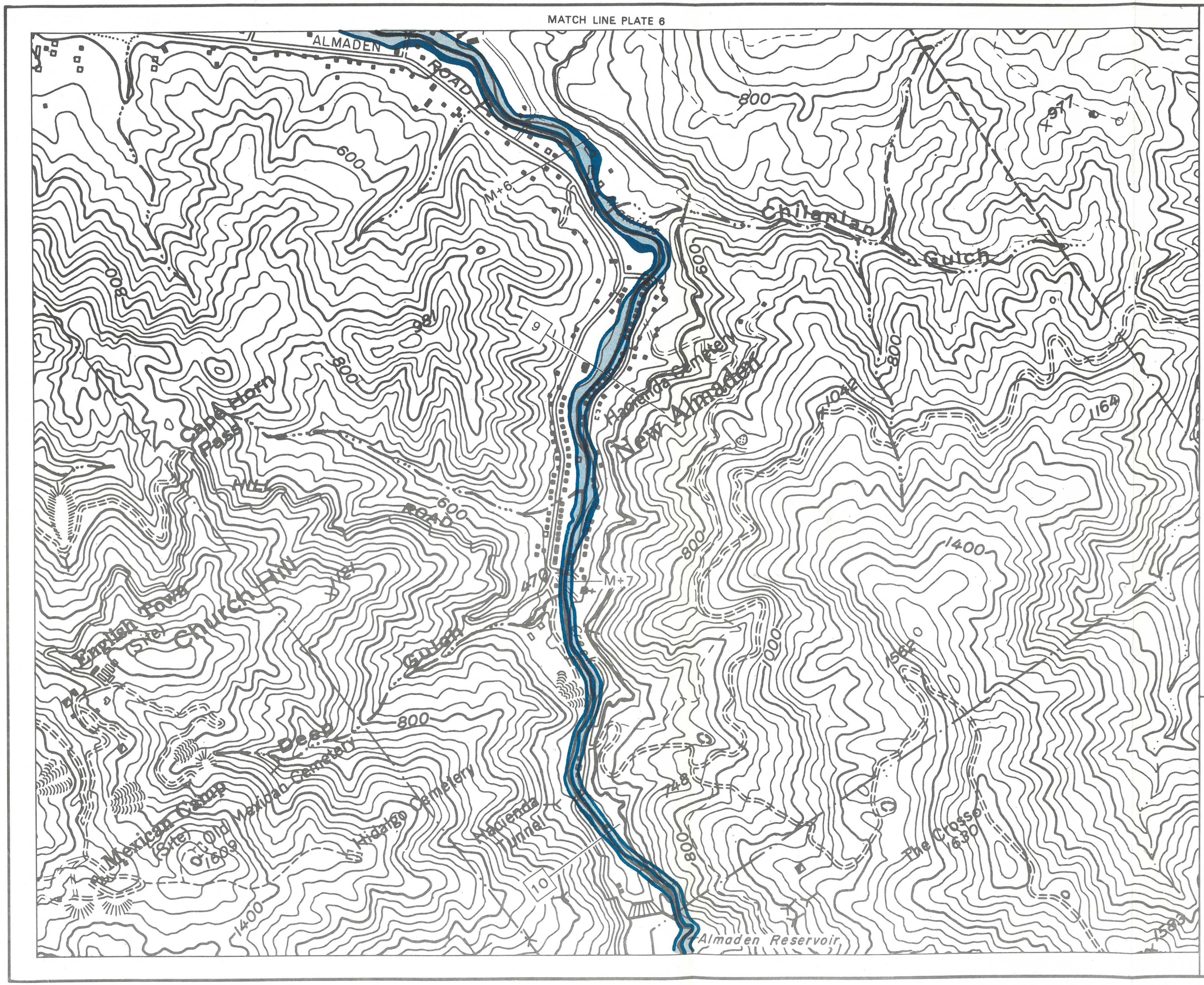
500 0 500 1000 1500
SCALE IN FEET

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

FLOOD PLAIN INFORMATION
ALAMITOS CREEK
SANTA CLARA COUNTY, CALIFORNIA

FLOODED AREAS

JULY 1973



LEGEND

OVERFLOW LIMITS

INTERMEDIATE REGIONAL FLOOD } STANDARD PROJECT FLOOD

M+4 MILES ABOVE MOUTH

22 CROSS SECTION

—260— GROUND ELEVATION IN FEET SEA LEVEL DATUM

CHANNEL

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT

AREAS OUTSIDE THE FLOODPLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

MINIMUM CONTOUR INTERVAL IS 10 FT.

500 0 500 1000 1500

SCALE IN FEET

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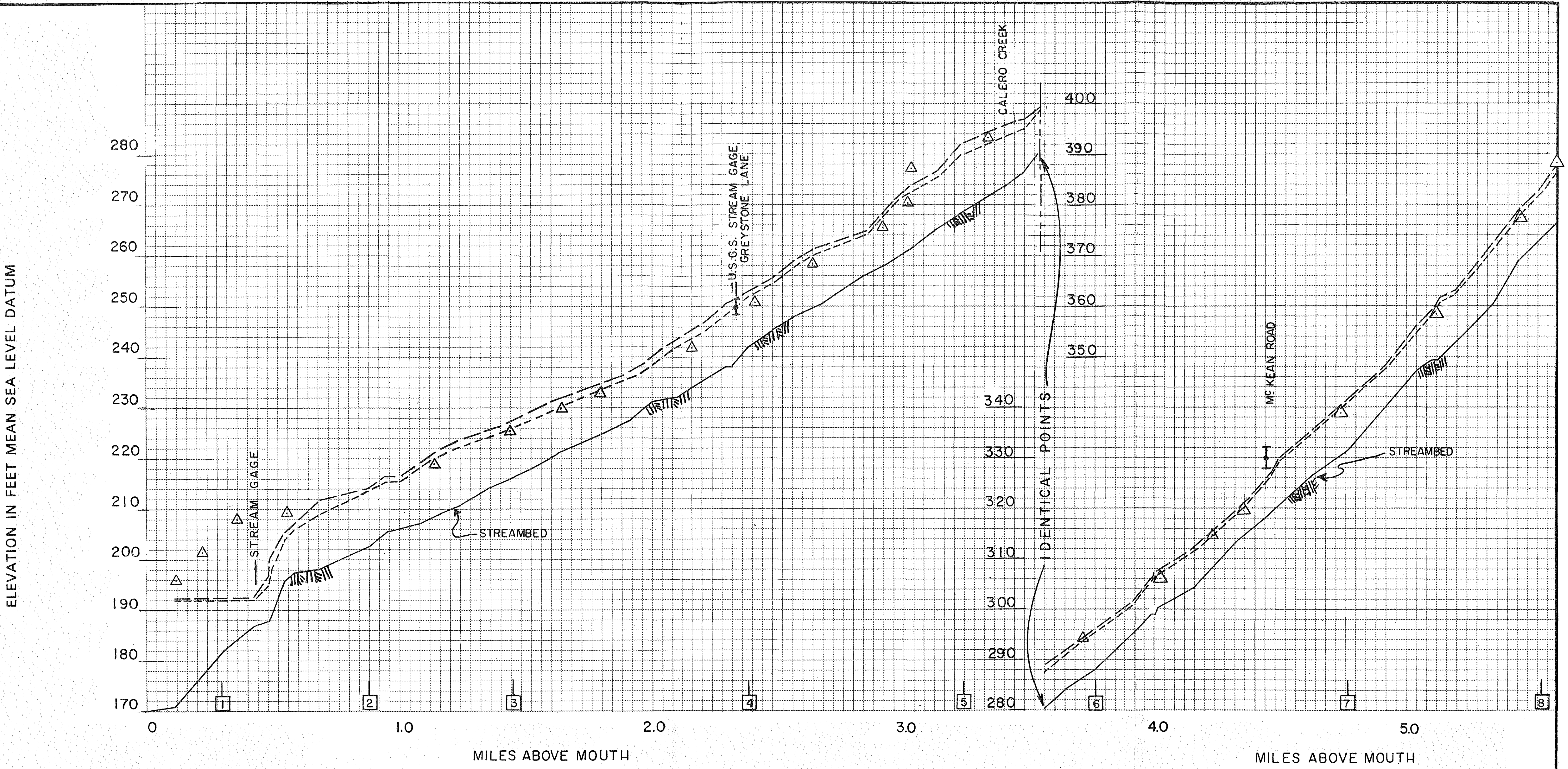
FLOOD PLAIN INFORMATION
ALAMITOS CREEK
SANTA CLARA COUNTY, CALIFORNIA

FLOODED AREAS

JULY 1973

PLATE 7



LEGEND

TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE

△ TOP OF LOW BANK

——— STANDARD PROJECT FLOOD

------- INTERMEDIATE REGIONAL FLOOD

8 CROSS SECTION NUMBER

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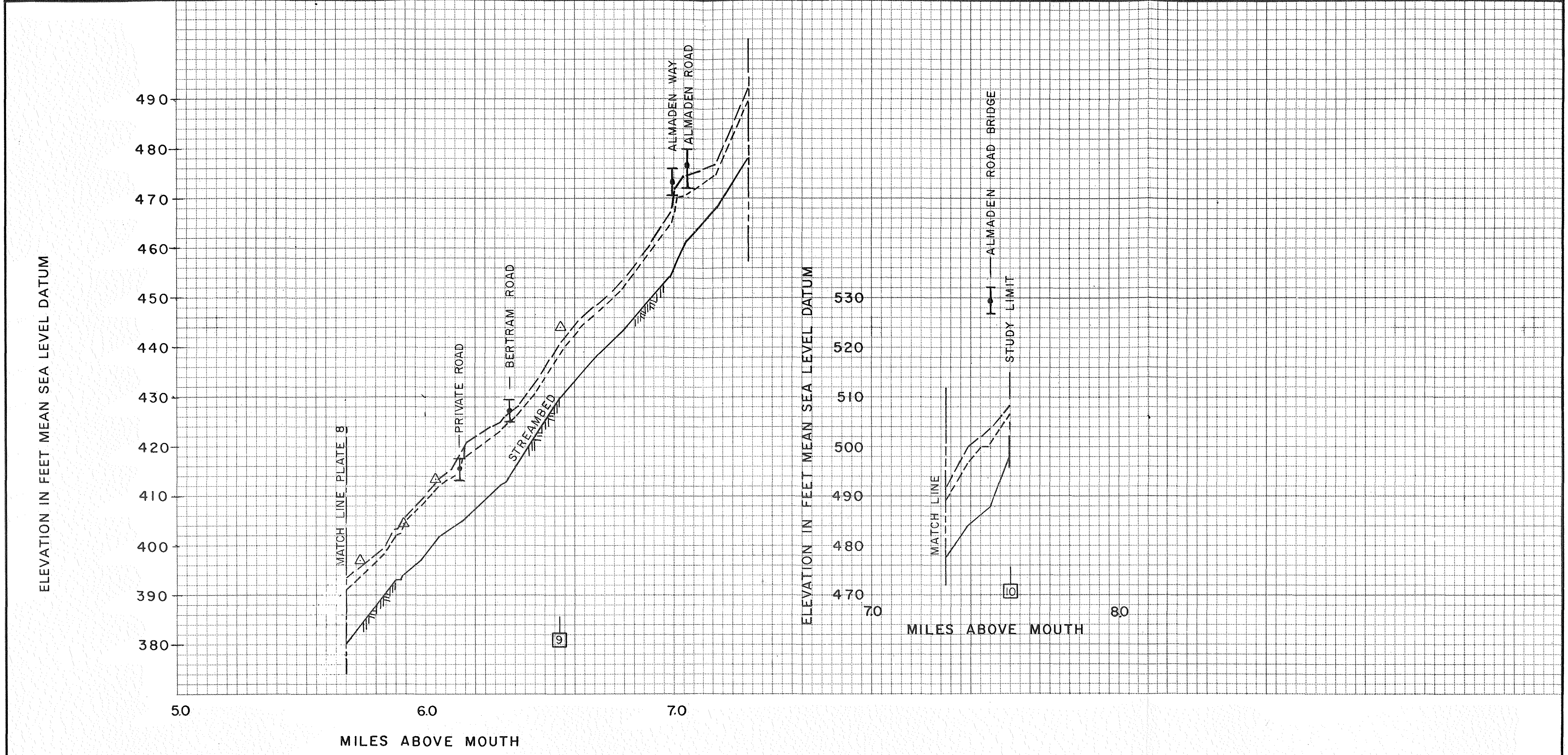
FLOOD PLAIN INFORMATION
SANTA CLARA COUNTY
CALIFORNIA

HIGH WATER PROFILES
ALAMITOS CREEK

JULY 1973

PLATE 8



LEGEND

TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE

△ TOP OF LOW BANK
— — — — STANDARD PROJECT FLOOD
- - - - - - - INTERMEDIATE REGIONAL FLOOD
9 CROSS SECTION NUMBER

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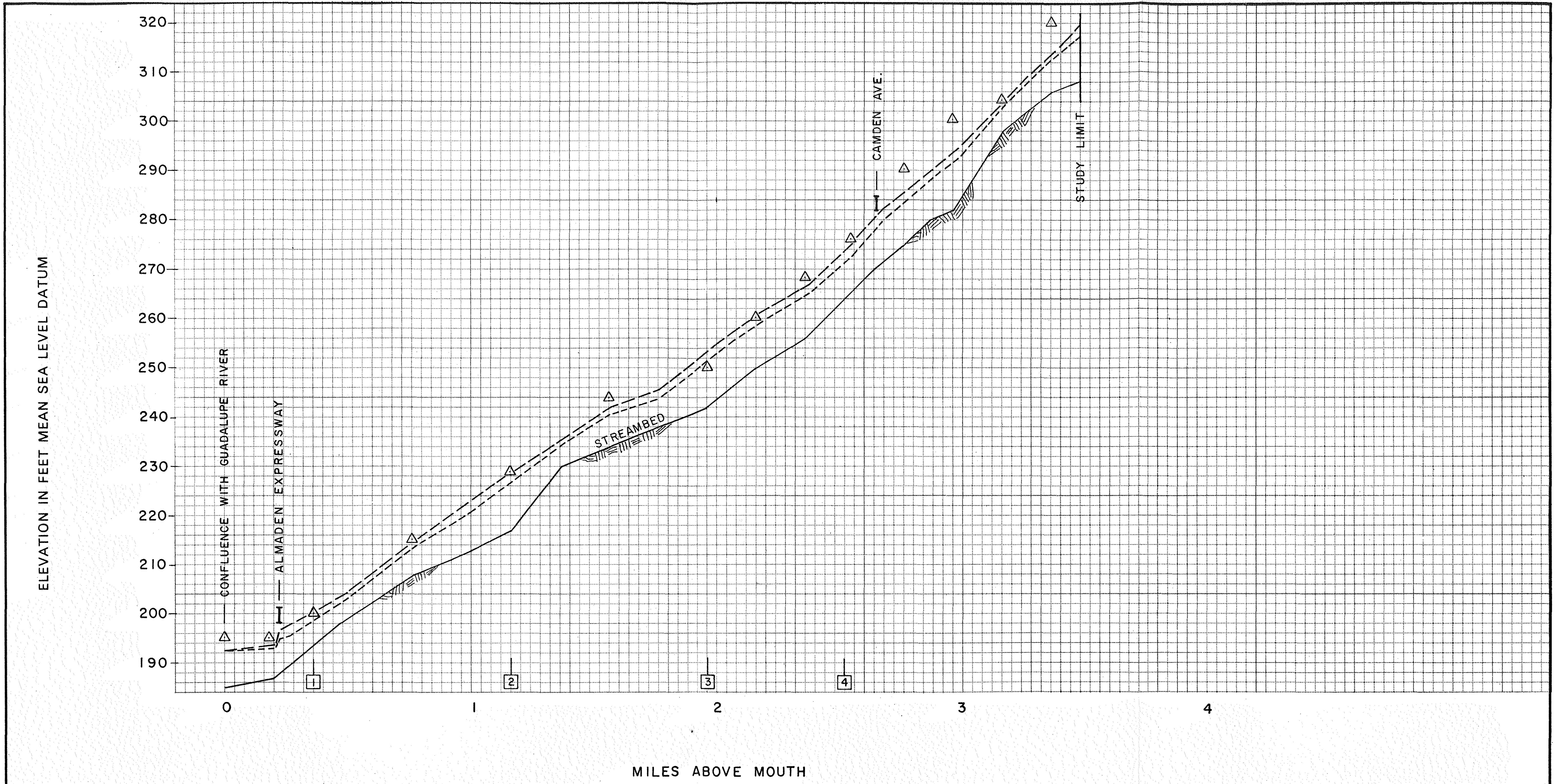
HIGH WATER PROFILES
ALAMITOS CREEK
JULY 1973



LEGEND

I TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE

△ TOP OF LOW BANK

— — — — STANDARD PROJECT FLOOD

- - - - - - INTERMEDIATE REGIONAL FLOOD

3 CROSS SECTION NUMBER

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FLOOD PLAIN INFORMATION

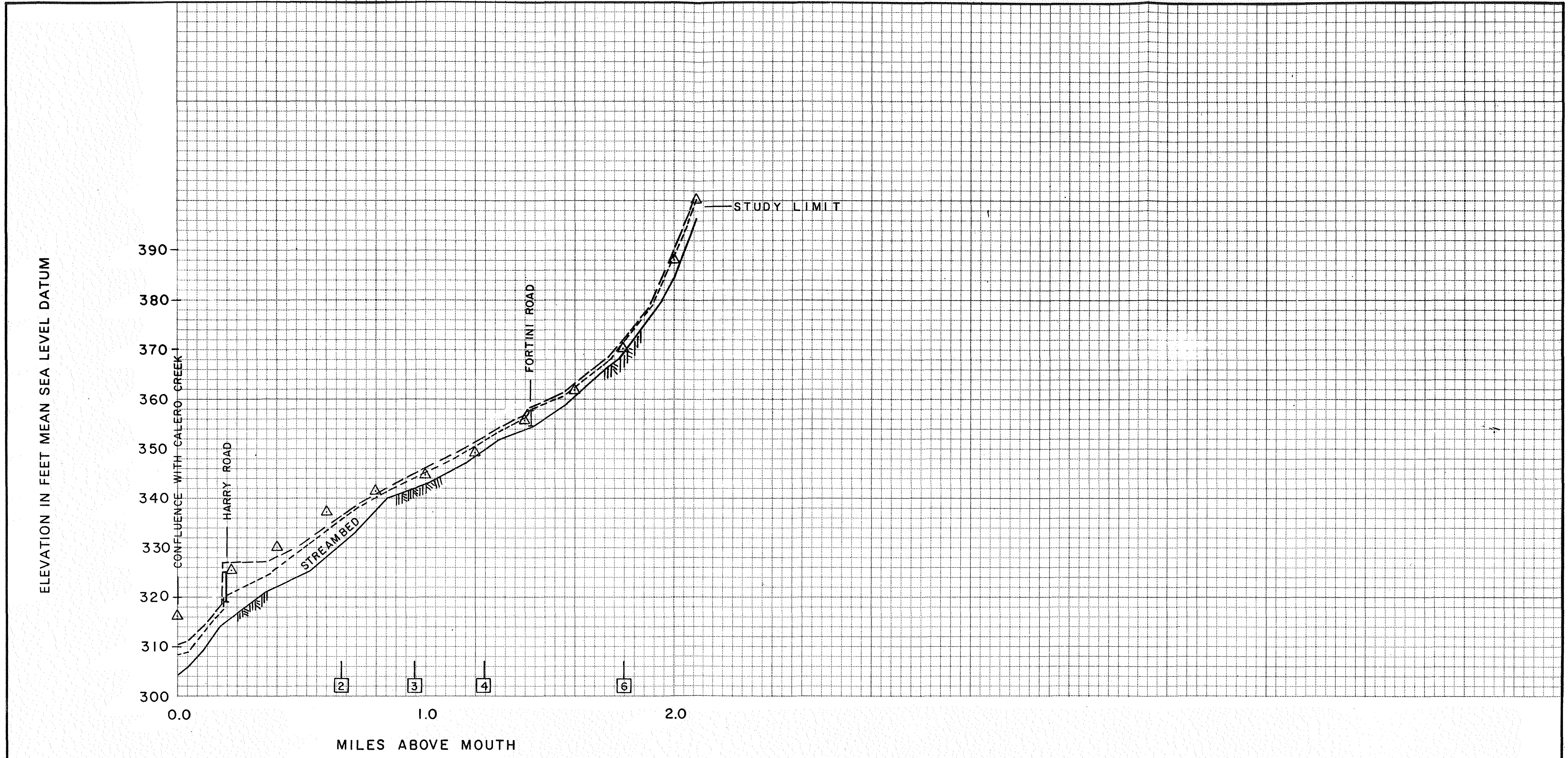
SANTA CLARA COUNTY
CALIFORNIA

HIGH WATER PROFILES

GUADALUPE CREEK

JULY 1973

PLATE 10



LEGEND

TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE

△ TOP OF LOW BANK

———— STANDARD PROJECT FLOOD

-------- INTERMEDIATE REGIONAL FLOOD

4 CROSS SECTION NUMBER

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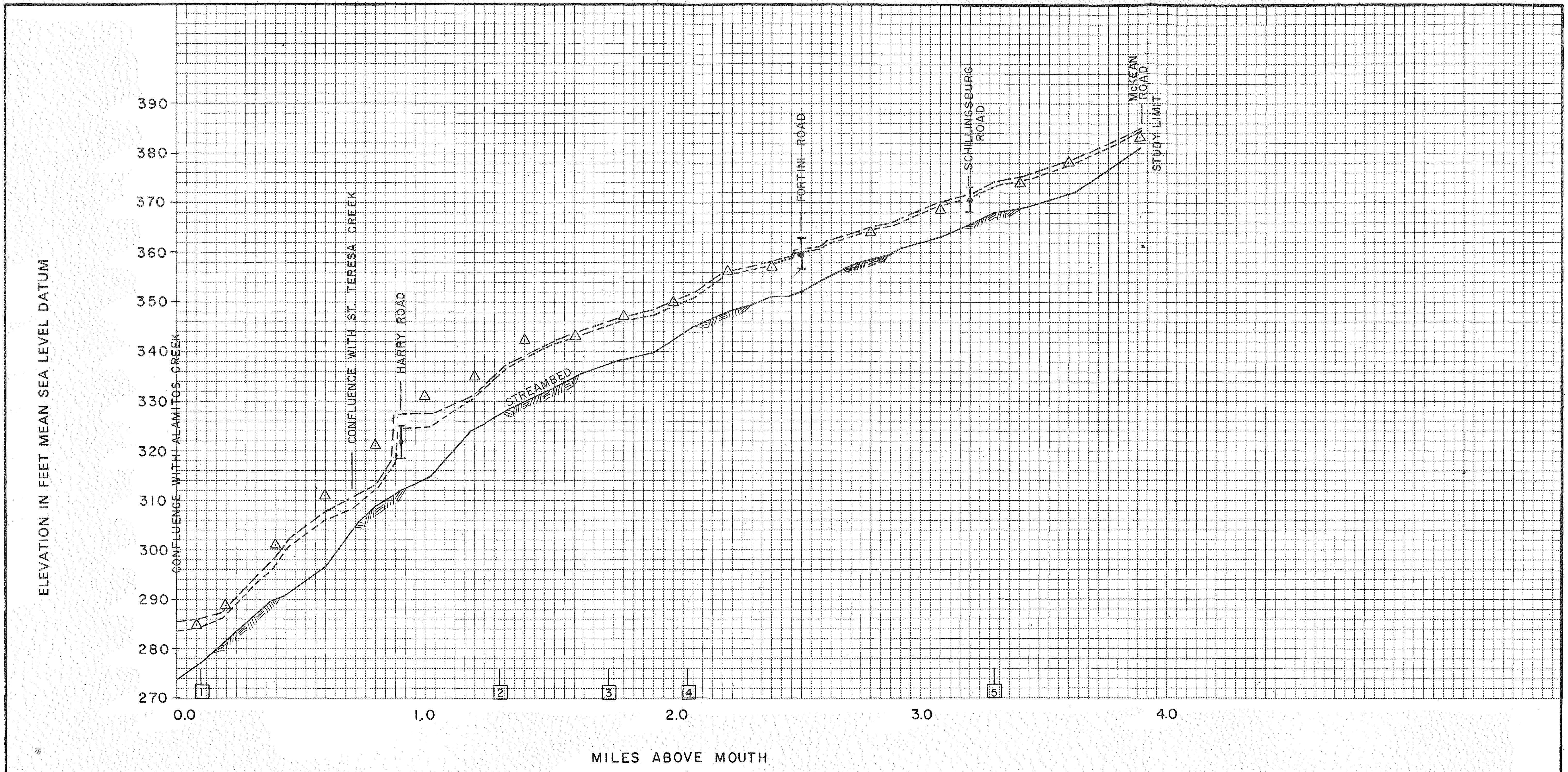
SANTA CLARA COUNTY
CALIFORNIA

HIGH WATER PROFILES
SANTA TERESA CREEK
JULY 1973

PLATE 11



LEGEND

TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE

△ TOP OF LOW BANK
— — — — STANDARD PROJECT FLOOD
- - - - - - - INTERMEDIATE REGIONAL FLOOD
3 CROSS SECTION NUMBER

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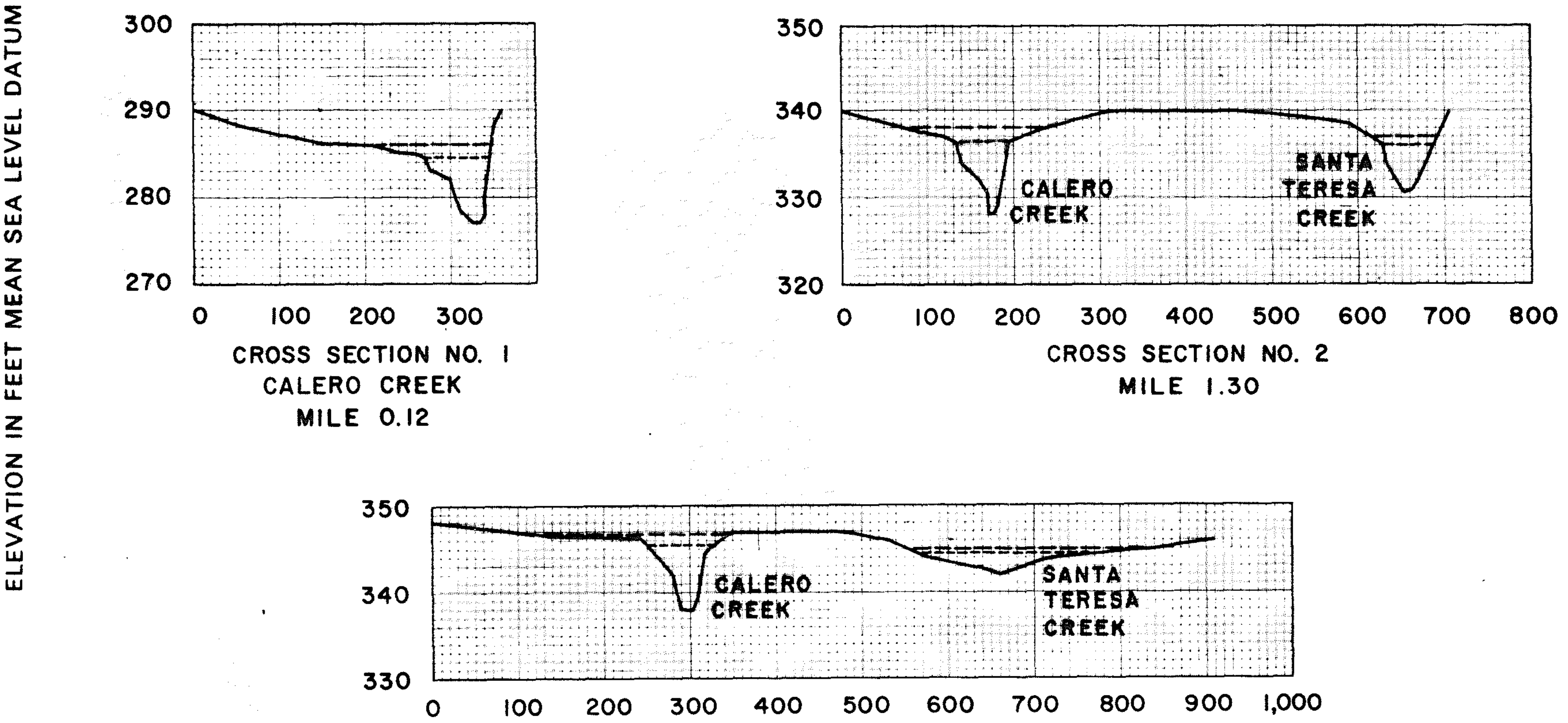
HIGH WATER PROFILES

ARROYO CALERO
JULY 1973



CROSS SECTION NO. 1
CALERO CREEK
MILE 0.12

CROSS SECTION NO. 2
MILE 1.30

CROSS SECTION NO. 3
MILE 1.72

HORIZONTAL DISTANCE IN FEET

LEGEND

——— STANDARD PROJECT FLOOD
- - - - - INTERMEDIATE REGIONAL FLOOD
SECTIONS TAKEN LOOKING DOWNSTREAM

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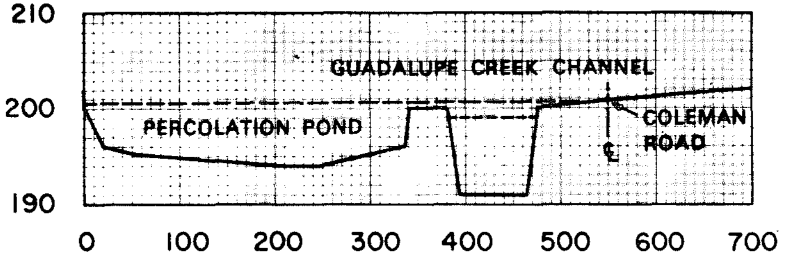
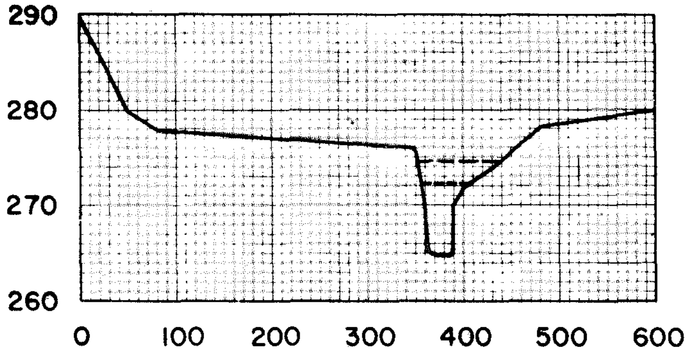
SELECTED CROSS SECTIONS

CALERO CREEK
SANTA TERESA
JULY 1973

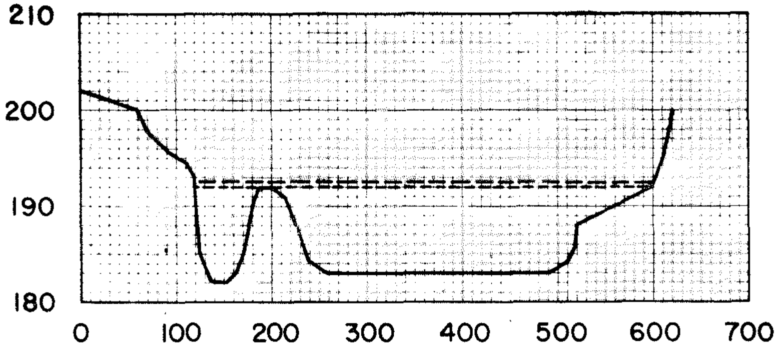
ELEVATION IN FEET MEAN SEA LEVEL DATUM



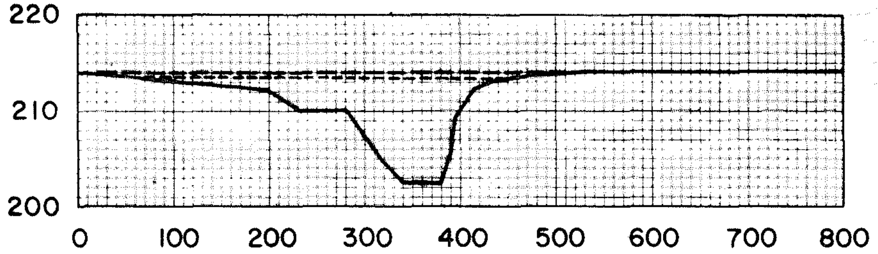
CROSS SECTION NO. 1
GUADALUPE CREEK
MILE 0.36



CROSS SECTION NO. 4
GUADALUPE CREEK
MILE 2.54



CROSS SECTION NO. 1
ALAMITOS CREEK
MILE 0.30



CROSS SECTION NO. 2
ALAMITOS CREEK
MILE 0.88

HORIZONTAL DISTANCE IN FEET

LEGEND

——— STANDARD PROJECT FLOOD
- - - - - INTERMEDIATE REGIONAL FLOOD
SECTIONS TAKEN LOOKING DOWNSTREAM

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

FLOOD PLAIN INFORMATION
SANTA CLARA COUNTY
CALIFORNIA

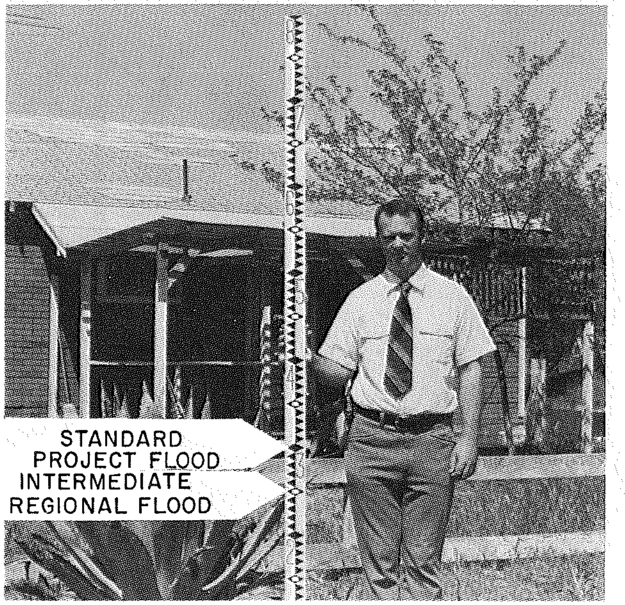
SELECTED CROSS SECTIONS
GUADALUPE CREEK
ALAMITOS CREEK
JULY 1973

ACTION IS NEEDED

The flood plain of Alamitos Creek is primarily agricultural with some residential and resort areas. Further development can be expected in the future. The Devastating effects of flooding will continue to increase unless action is taken.

Effective regulatory measures such as zoning ordinances and building codes can be designed to prevent increased flood damages. Flood proofing can reduce potential damages to properties already subject to flooding, and additional works to modify flooding can also be a part of the long run solution. At the present time there are no flood control projects on the streams of the study area.

The Alamitos Creek system is not the only group of streams with flooding problems. Flood plain information has already been provided for many of the several thousand flood prone areas. Many of those having FPI reports have adopted or strengthened regulations, while others have them under study. Some communities have used the FPI reports to establish interim land use control.



POTENTIAL FLOODING ALONG SANTA TERESA CREEK

This folder has been prepared for the Santa Clara County Flood Control and Water District by the U.S. Army Corps of Engineers from data in the report "Flood Plain Information, Alamitos Creek, Santa Clara County, California." Copies of the report and this folder are available upon request from the Santa Clara County Flood Control and Water District, 5750 Almaden Expressway, San Jose, California 95118.

Inside are sketches illustrating the horizontal and vertical relationships of flooded areas and a flood area map from the report showing the extent of both a large flood (IRF) and a very large flood (SPF).

FLOODS

ON

ALAMITOS CREEK

(INCLUDING GUADALUPE CREEK - ARROYO CALERO AND SANTA TERESA CREEK)

SANTA CLARA COUNTY

CALIFORNIA

FLOODS

ON

ALAMITOS - CALERO CREEK

This folder is an announcement of and supplement to the "Flood Plain Information Report (FPI) Alamitos Creek, Santa Clara County, California." The report has been prepared because a knowledge of the flood potential and flood hazard is important in land use planning and for management decisions concerning flood plain utilization.

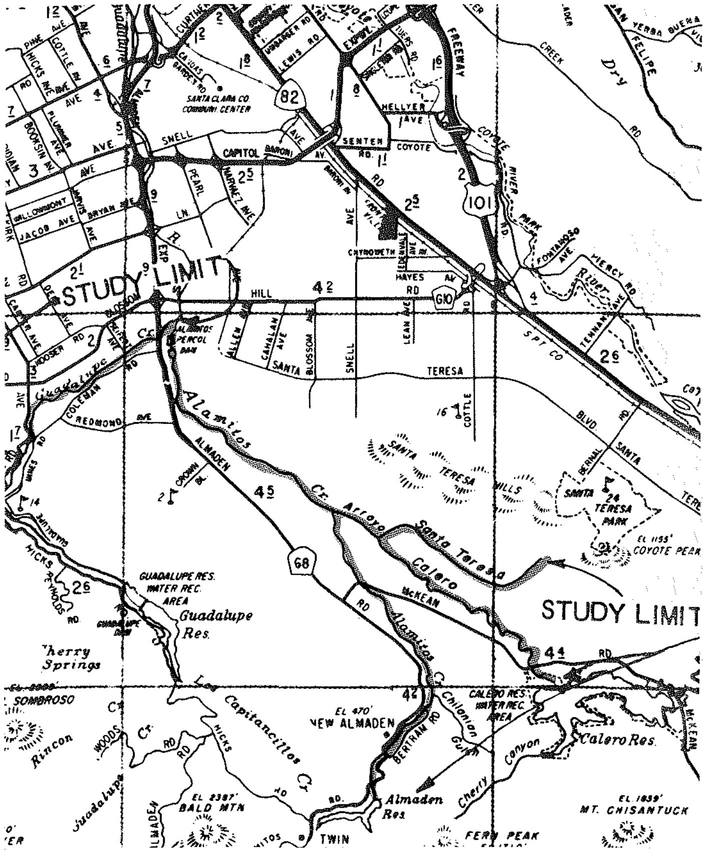
Although extensive flood damage has occurred on Alamitos Creek in the past, studies indicate that even larger floods can occur in the future. Emphasis is given to future floods in the FPI report. Maps, profiles, and cross-sections have been included to illustrate the possible extent and severity of future floods.

Highest Floods Recorded on Alamitos Creek Upstream of Guadalupe Creek are listed below.

DATE OF CREST	*STAGE IN FEET*
2 April 1958	9.67
23 December 1955	6.60*
24 January 1967	6.25
Large (100-year) — IRF	12.10**
Very Large — SPF	13.46**

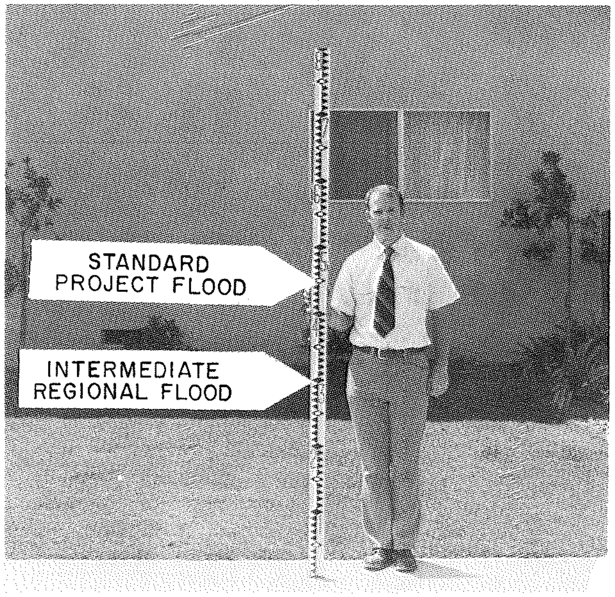
*Gage 0.6 mile upstream of confluence with Guadalupe Creek

**Estimated

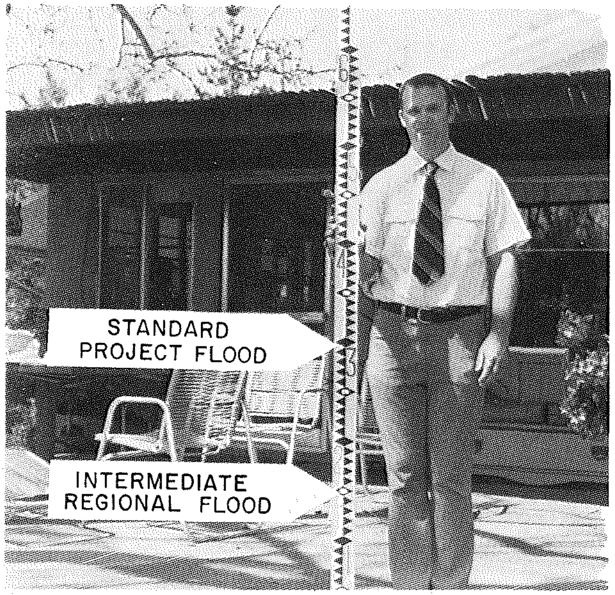


Basic Map Reproduced by Permission of the California State Automobile Association, Copyright Owner.

Information regarding flooding along the creeks of the Alamitos system may be found in a report published by the San Francisco District of the Corps of Engineers — the report titled — "Flood Plain Information Alamitos Creek was prepared for the Santa Clara County Flood Control And Water District — the report is available from their office. The limits of the study are indicated on the above map.

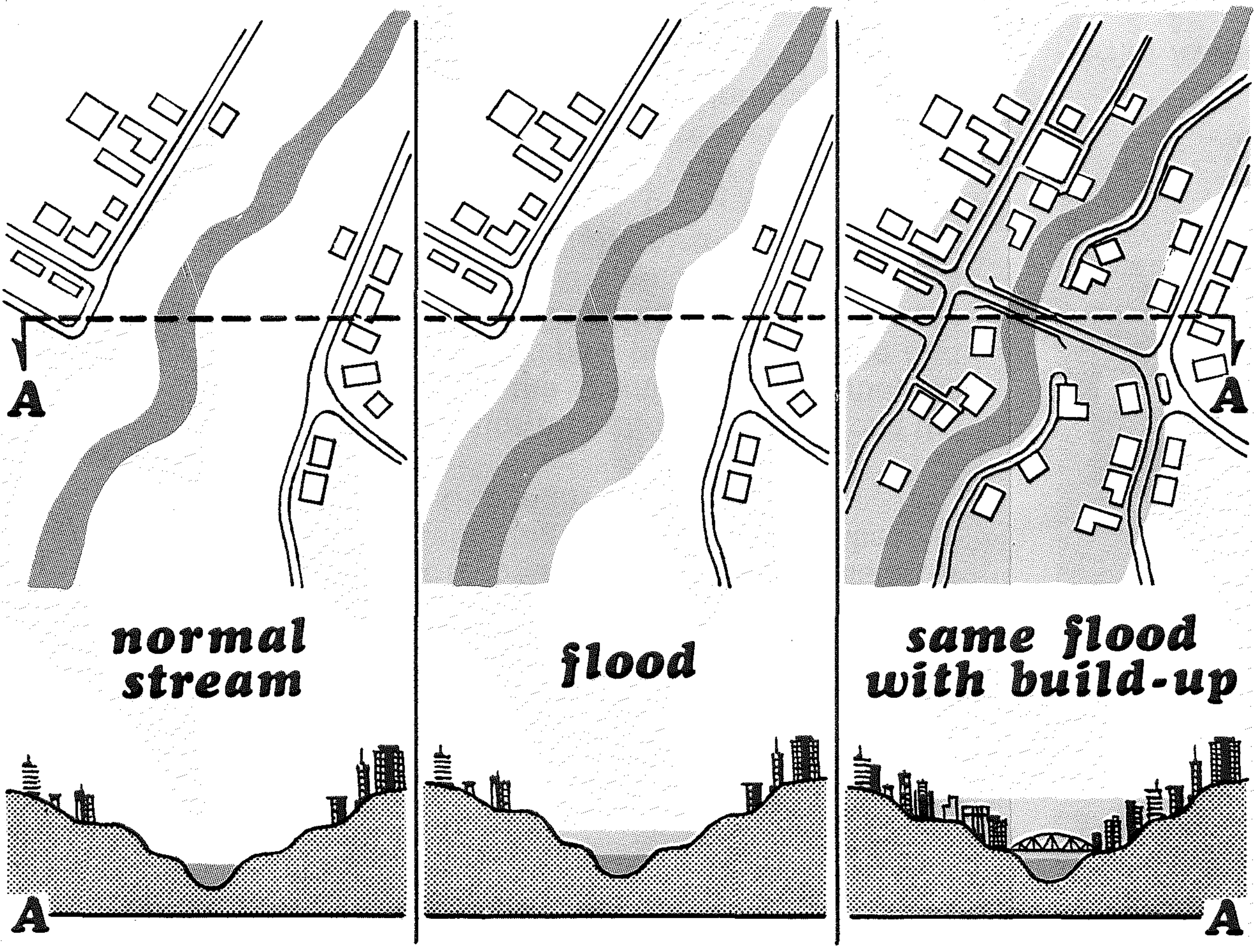


Alamitos Creek — Winterset Way and Camden Avenue.



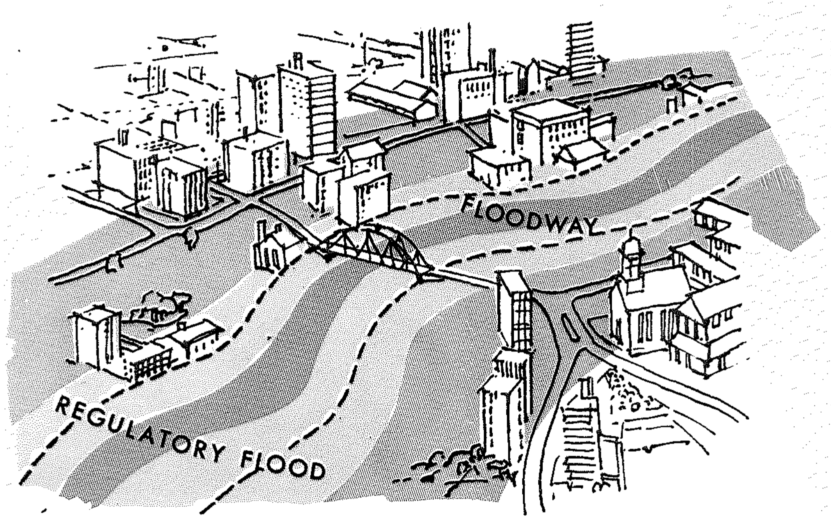
Fortini Avenue alongside Calero Creek.

BUILDING in the FLOOD PLAIN can make FLOODS WIDER and DEEPER



this ENCROACHMENT can change a Small Flood into a MAJOR FLOOD

TOOLS of FLOOD PLAIN MANAGEMENT for the reduction of Flood Damage and Human Suffering



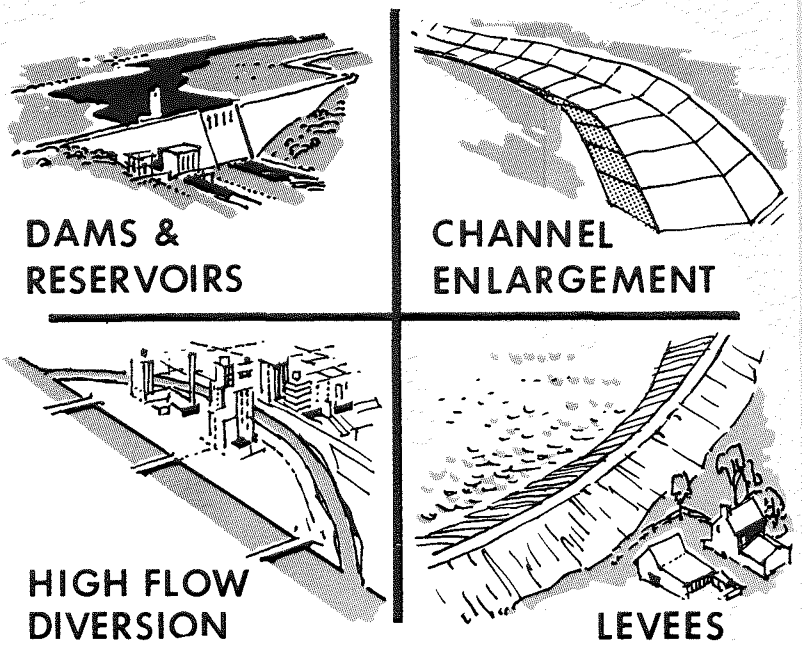
MEASURES TO REDUCE *VULNERABILITY TO FLOODS*

provide for a future with more freedom from flood damage, often at minor cost and with little adverse effect on the environment • • • • • •

REGULATIONS
(ZONING, BUILDING CODES, SUBDIVISION)
• FLOOD PROOFING • RELOCATIONS •
• URBAN RENEWAL •

MEASURES TO MODIFY FLOODS

are often required to alleviate existing problems and sometimes to forestall future problems • • •



OTHER MEASURES

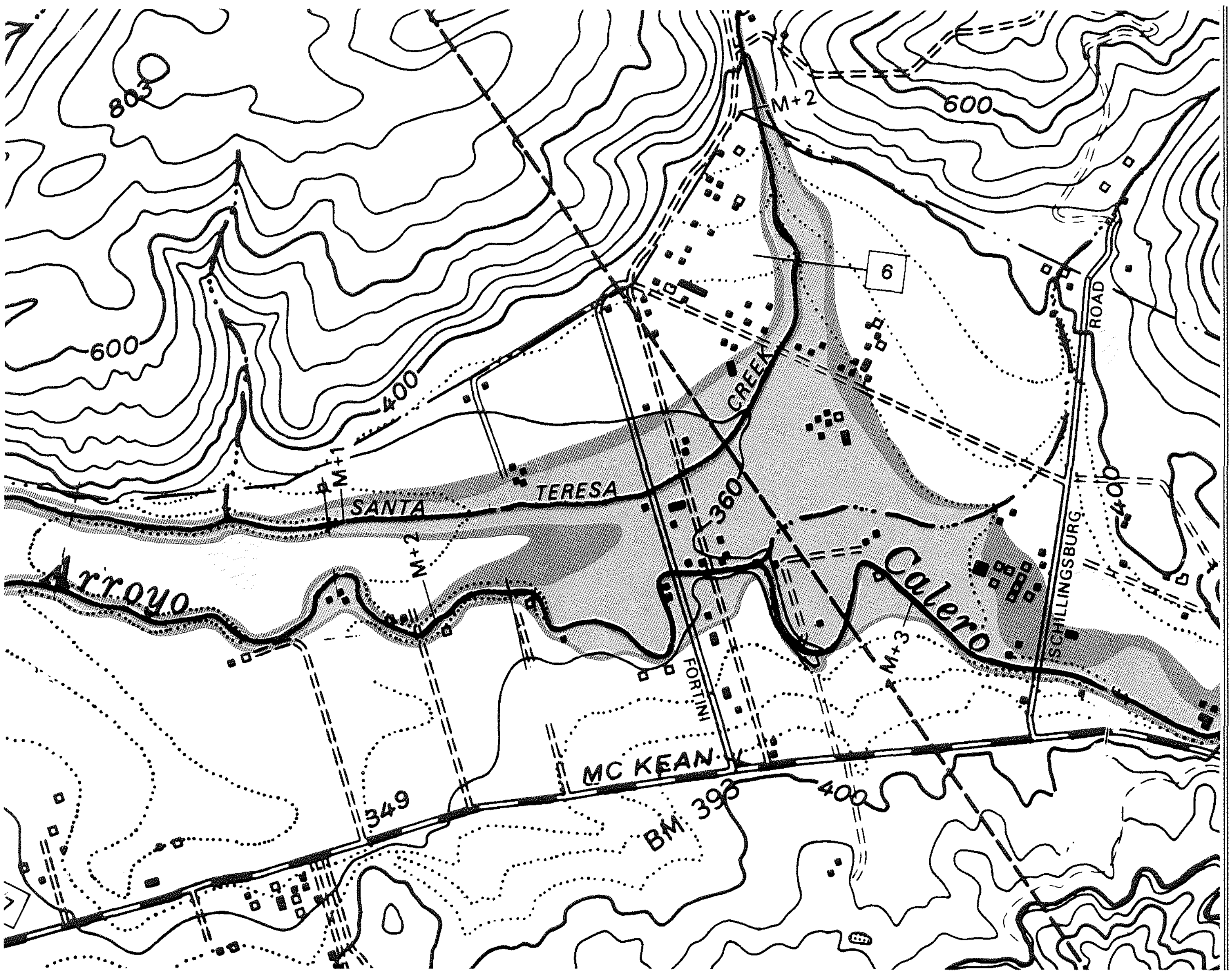
aid the Flood Plain occupant in coping with floods • • •

EDUCATION

TAX ADJUSTMENTS

FLOOD INSURANCE

WARNING & EMERGENCY PLANS



FLOOD PATTERNS
FOR
ALAMITOS-CALERO CREEK

LEGEND

approximate limits of overflow

▓ NORMAL STREAM

░ INTERMEDIATE REGIONAL FLOOD (IRF)

▒ STANDARD PROJECT FLOOD (SPF)

PROFILES in the Flood Plain Information Report show elevations of these floods for the entire study area